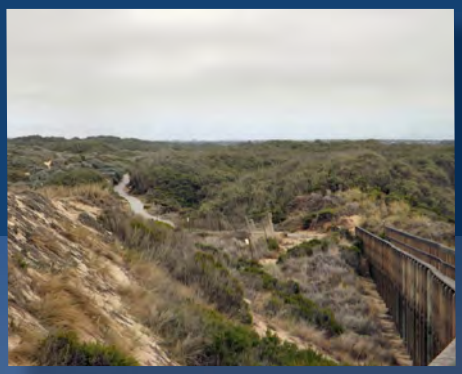










Draft
Habitat Conservation Plan for the Oceano Dunes District

July 2025

This page intentionally left blank

Draft Habitat Conservation Plan
for the California Department of Parks and Recreation
Oceano Dunes District

Prepared for:

California State Parks
Off-Highway Motor Vehicle Recreation Division
Oceano Dunes District
340 James Way, Ste. 270
Pismo Beach, CA

Prepared by:
MIG
2055 Junction Ave., Suite 205
San Jose, CA 95131
(650) 327-0429

July 2025

This page intentionally left blank

CONTENTS

CONTENTS i

EXECUTIVE SUMMARY ix

GLOSSARY xiii

Chapter 1. Introduction and Background 1-1

1.1 Overview and Background 1-1
1.1.1 Purpose and Goals 1-1
1.2 Permit Holder/Permit Term 1-2
1.3 Permit Boundary/Covered Lands 1-3
1.3.1 Pismo State Beach 1-3
1.3.2 Oceano Dunes State Vehicular Recreation Area 1-4
1.4 Species to be Covered by the Permit 1-4
1.5 Regulatory Framework 1-5
1.5.1 Federal Endangered Species Act 1-5
1.5.2 The Section 10(a)(1)(B) Process – Habitat Conservation Plan Requirements and Guidelines 1-7
1.5.3 California Endangered Species Act 1-8
1.5.4 State of California Fully Protected Species 1-8
1.5.5 National Environmental Policy Act and California Environmental Quality Act 1-9
1.5.6 National Historic Preservation Act 1-9
1.5.7 Superintendent's Orders 1-9
1.5.8 Park Designations 1-10
1.5.9 Existing General Plan and Other Plans 1-11

Chapter 2. Project Description/Covered Activities 2-1

2.1 Project Description 2-1
2.2 Activities Covered by Permit 2-1
2.2.1 Park Visitor Activities 2-3
2.2.2 Natural Resources Management Program 2-14
2.2.3 Park Maintenance 2-31
2.2.4 Visitor Services 2-35
2.2.5 Other HCP Covered Activities 2-38
2.2.6 Activities Not Covered by Permit 2-48
2.2.7 Public Works Plan 2-49

Chapter 3. Environmental Setting/Biological Resources 3-1

3.1 Environmental Setting 3-1
3.1.1 Climate 3-1
3.1.2 Topography/Geology 3-1
3.1.3 Hydrology/Streams, Rivers, Drainages 3-2
3.1.4 Land Use and Acquisition Background 3-3
3.1.5 HCP Area Habitats 3-4
3.1.6 Common Wildlife in the HCP Area 3-12
3.2 Identifying Suitable Covered Species' Habitat in the HCP Area 3-12
3.3 Covered Wildlife 3-13
3.3.1 Western Snowy Plover (*Charadrius nivosus nivosus*) 3-13

3.3.2 California Least Tern (*Sternula antillarum browni*) 3-36
3.3.3 Southwestern Pond Turtle (*Actinemys pallida*) 3-57
3.3.4 California Red-Legged Frog (*Rana draytonii*) 3-60
3.3.5 Western Spadefoot (*Spea hammondii*) 3-67
3.3.6 Tidewater goby (*Eucyclogobius newberryi*) 3-69
3.4 Listed Plant Species 3-76
3.4.1 Marsh Sandwort (*Arenaria paludicola*) 3-77
3.4.2 La Graciosa Thistle (*Cirsium scariosum* var. *loncholepis*) 3-80
3.4.3 Surf Thistle (*Cirsium rhothophilum*) 3-84
3.4.4 Beach Spectaclepod (*Dithyrea maritima*) 3-86
3.4.5 Nipomo Mesa Lupine (*Lupinus nipomensis*) 3-87
3.4.6 Gambel's Watercress (*Nasturtium gambelii*) 3-91

Chapter 4. Potential Biological Effects/Take Assessment 4-1

4.1 Overview 4-1
4.2 Methods Used to Analyze Effects on Covered Species 4-2
4.3 Western Snowy Plover 4-3
4.3.1 Direct and Indirect Effects of Covered Activities on Western Snowy Plover 4-3
4.3.2 Anticipated Take of Western Snowy Plover 4-55
4.3.3 Anticipated Impacts of the SNPL Taking 4-63
4.4 California Least Tern 4-64
4.4.1 Direct and Indirect Effects of Covered Activities on California Least Tern 4-65
4.4.2 Anticipated Take of California Least Tern 4-106
4.4.3 Anticipated Impacts of the CLTE Taking 4-112
4.5 Southwestern Pond Turtle 4-114
4.5.1 Direct and Indirect Effects 4-114
4.5.2 Anticipated Take of Southwestern Pond Turtle 4-129
4.5.3 Anticipated Impacts of the Southwestern Pond Turtle Taking 4-133
4.6 California Red-Legged Frog 4-134
4.6.1 Direct and Indirect Effects 4-134
4.6.2 Anticipated Take of California Red-Legged Frog 4-150
4.6.3 Anticipated Impacts of the CRLF Taking 4-154
4.7 Western Spadefoot 4-155
4.7.1 Direct and Indirect Effects 4-156
4.7.2 Anticipated Take of Western Spadefoot 4-172
4.7.3 Anticipated Impacts of the Western Spadefoot Taking 4-176
4.8 Tidewater Goby 4-177
4.8.1 Direct and Indirect Effects 4-178
4.8.2 Anticipated Take of Tidewater Goby 4-187
4.8.3 Anticipated Impacts of the Tidewater Goby Taking 4-190
4.9 Summary of the Potential for Take 4-191
4.10 Listed Plants 4-199
4.10.1 Methods to Assess Effects of Covered Activities on Listed Plants 4-199
4.10.2 Direct and Indirect Effects 4-199
4.10.3 Anticipated Impacts on Listed Plant Species 4-208
4.10.4 Overall Impacts to Listed Plant Species 4-211
4.11 Effects on Critical Habitat 4-215
4.11.1 Western Snowy Plover 4-215

4.11.2 Tidewater Goby 4-219
4.11.3 La Graciosa Thistle 4-221
4.12 Cumulative Impacts 4-223
4.12.1 Urban Growth 4-223
4.12.2 Ongoing and Routine Agriculture 4-223
4.12.3 Operation of Lopez Dam 4-224

Chapter 5. Conservation Program 5-1

5.1 Summary of Conservation Program 5-1
5.2 Biological Goals and Objectives for Covered Species 5-1
5.2.1 Western Snowy Plover Goals and Objectives 5-2
5.2.2 California Least Tern Goals and Objectives 5-6
5.2.3 Changes to the 6 Exclosure for Western Snowy Plover and California Least Tern 5-9
5.2.4 Southwestern Pond Turtle Goals and Objectives 5-11
5.2.5 California Red-Legged Frog Goals and Objectives 5-13
5.2.6 Western Spadefoot Goals and Objectives 5-15
5.2.7 Tidewater Goby Goals and Objectives 5-17
5.2.8 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress Goals and Objectives 5-19
5.3 Avoidance, Minimization, and Mitigation Measures 5-20
5.3.1 Measures to Avoid and Minimize Impacts 5-20
5.3.2 Mitigation Measures 5-71
5.4 Monitoring 5-75
5.4.1 Western Snowy Plover and California Least Tern 5-75
5.4.2 Southwestern Pond Turtle 5-82
5.4.3 California Red-Legged Frog 5-83
5.4.4 Western Spadefoot 5-84
5.4.5 Tidewater Goby 5-86
5.4.6 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress 5-88
5.5 Adaptive Management 5-89
5.5.1 Adaptive Management Approach 5-89
5.5.2 Success Criteria and Performance Standards 5-90
5.5.3 Role of Monitoring in Adaptive Management 5-106
5.5.4 Modifications to the Conservation Program 5-106
5.5.5 Triggers for Revisions to the Conservation Program 5-107
5.5.6 Adaptive Management Process 5-109
5.5.7 Public Emergency Response 5-111
5.6 Reporting 5-111

Chapter 6. Plan Implementation 6-1

6.1 Permittee – CDPR 6-1
6.2 Permitting Agency – USFWS 6-1
6.3 Other Regulatory Agencies 6-1
6.3.1 CDFW 6-1
6.3.2 California Coastal Commission 6-1
6.4 Plan Oversight 6-1
6.4.1 Annual Report 6-1
6.4.2 Special Project Notification 6-2

6.5 CHANGED AND UNFORESEEN CIRCUMSTANCES 6-2
6.5.1 Changed Circumstances 6-3
6.5.2 Unforeseen Circumstances 6-10
6.6 AMENDMENTS 6-11
6.6.1 Administrative Changes 6-11
6.6.2 Minor Amendments 6-11
6.6.3 Major Amendments 6-13
6.7 ENFORCEMENT 6-14
6.8 SUSPENSION/REVOCATION 6-14
6.9 FEDERAL PERMIT RENEWAL 6-14
6.10 PERMIT TRANSFER 6-14

Chapter 7. Funding 7-1

7.1 COSTS OF HCP IMPLEMENTATION 7-1
7.2 FUNDING SOURCE(S) 7-3
7.3 FUNDING MECHANISM AND MANAGEMENT 7-3

Chapter 8. Alternatives 8-1

8.1 SUMMARY 8-1
8.2 NO ACTION ALTERNATIVE 8-1
8.3 MAINTAIN NORTHERN EXCLOSURE BOUNDARY ALTERNATIVE 8-1
8.4 INCREASED PATROLS AND/OR STAFFING ALTERNATIVE 8-2
8.5 PROJECT-BY-PROJECT PERMITTING 8-2

Chapter 9. Maps 9-1

Chapter 10. Bibliography 10-1

Tables

Table 1-1. Species Proposed for Coverage 1-5

Table 2-1. Oceano Dunes District HCP Area Land Use Acreage 2-4

Table 2-2. 2022 Oceano Dunes District Daily Visitor Use Levels – Day Use 2-6

Table 2-3. 2022 Oceano Dunes District Daily Visitor Use Levels – Camping 2-8

Table 2-4. Recent Restoration Efforts within the Oceano Dunes District 2-28

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024) 3-5

Table 3-2. Number of SNPL Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 11) 3-22

Table 3-3. Range-wide SNPL Breeding Survey Results, 2002–2023 3-24

Table 3-4. Estimated Breeding Season Population Sizes of SNPL in the HCP Area Based on Annual Window Surveys and Intensive Monitoring of Breeding Individuals 3-26

Table 3-5. Number of SNPL Observed During Winter Season Window Surveys in San Luis Obispo County 3-27

Table 3-6. Average Number of Wintering* SNPL Observed Between October and February in the HCP Area** 3-29

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2023 3-30
Table 3-8. Number of SNPL Chicks Fledged Per Breeding Male in the HCP Area, 2002–2023 3-34
Table 3-9. Number of CLTE Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 13).....3-42
Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023 3-43
Table 3-11. Number of CLTE Chicks Fledged Per Pair in the HCP Area and Statewide, 2006–2023.....3-52
Table 3-12. Number of Reported Breeding CLTE Pairs and Juveniles Produced at Oceano Dunes SVRA and the Combined Sites of Rancho Guadalupe Dunes County Park (RGDCP), Vandenberg Space Force Base (VSFB), and Coal Oil Point Reserve (COPR), 2004–2023 3-52
Table 3-13. CRLF Protocol-Level Survey Results (Highest Number Observed) and Other CRLF Observations in the HCP Area (January 2017– June 2024) 3-62
Table 3-14. Results from Surveys for Tidewater Goby at Arroyo Grande Creek, 2005–2023 3-75
Table 3-15. Marsh Sandwort Occurrences In* and Near the HCP Area (Map 19).....3-79
Table 3-16. La Graciosa Thistle Occurrences In* and Near the HCP Area (Map 20).....3-82
Table 3-17. Surf Thistle Occurrences In* and Near the HCP Area (Map 21) 3-85
Table 3-18. Beach Spectaclepod Occurrences In* and Near the HCP Area (Map 22) 3-86
Table 3-19. Nipomo Mesa Lupine Occurrences In* and Near the HCP Area (Map 23) 3-89
Table 3-20. Gambel's Watercress Occurrences In* and Near the HCP Area (Map 24) 3-93
Table 4-1. Summary of Injury and Mortality of Adult and Juvenile SNPL, 2001-February 2024 4-57
Table 4-2. Summary of SNPL Chick and Egg Mortality, Injury/Rescue, or at Risk of Take, 2001-2023....4-60
Table 4-3. Summary of Estimated SNPL Take (Park Operations, Recreation, Non-Recovery Activities).4-62
Table 4-4. Summary of Annual Injury or Mortality of Adult and Juvenile CLTE, 2001-2023 4-108
Table 4-5. Summary of Estimated CLTE Take (Park Operations, Recreation, Non-Recovery Action)....4-112
Table 4-6. Summary of Estimated Southwestern Pond Turtle Take.....4-132
Table 4-7. Summary of Estimated Loss of Southwestern Pond Turtle Habitat 4-133
Table 4-8. Summary of Effects on CRLF and Estimated CRLF Take.....4-153
Table 4-9. Summary of Estimated Loss of CRLF Habitat 4-153
Table 4-10. Summary of Effects on Western Spadefoot and Estimated Western Spadefoot Take.....4-175
Table 4-11. Summary of Estimated Loss of Western Spadefoot Habitat 4-176
Table 4-12. Summary of Effects on Tidewater Goby and Allowable Tidewater Goby Take 4-189
Table 4-13. Summary of Estimated Loss of Tidewater Goby Habitat.....4-190
Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation 4-193
Table 4-15. Maximum Allowable Permanent and Temporary Impacts to Listed Plant Species Habitat.....4-211

Table 5-1. Breeding Adult SNPL Management Potential Breeding Numbers Apportioned to the Subdivisions of Pismo Beach/Nipomo Dunes (Unit CA-83) Area 5-3
Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL 5-21
Table 5-3. Avoidance and Minimization Measures for CLTE 5-33
Table 5-4. Avoidance and Minimization Measures for SWPT 5-44
Table 5-5. Avoidance and Minimization Measures for CRLF 5-51
Table 5-6. Avoidance and Minimization Measures for WSF 5-57
Table 5-7. Avoidance and Minimization Measures for Tidewater Goby 5-63
Table 5-8. Avoidance and Minimization Measures for Plants 5-68
Table 5-9. Biological Goals, Objectives, and Success Criteria for SNPL 5-90
Table 5-10. Biological Goals, Objectives, and Success Criteria for CLTE 5-92
Table 5-11. Biological Goals, Objectives, and Success Criteria for SWPT 5-95
Table 5-12. Biological Goals, Objectives, and Success Criteria for CRLF 5-97
Table 5-13. Biological Goals, Objectives, and Success Criteria for WSF 5-99
Table 5-14. Biological Goals, Objectives, and Success Criteria for Tidewater Goby 5-102
Table 5-15. Biological Goals, Objectives, and Success Criteria for Listed Plants 5-104
Table 7-1. Annual HCP Expenses Fully Implemented 7-1
Table 7-2. Annual HCP Implementation Costs Per Covered Species by Taxon (taxonomic group for plants) and Expense Category 7-1
Table 7-3. SNPL and CLTE Tasks Full HCP Implementation Costs 7-2
Table 7-4. Costs Over the Life of the HCP 7-2

Figures

Figure 3-1. Number of SNPL nests, nests hatched, chicks, chicks fledged, and minimum number of breeding males. 3-17
Figure 3-2. Number of SNPL fledglings per breeding male at Oceano Dunes District, 2002–2023. 3-35
Figure 3-3. Three-year running average number of SNPL fledglings per breeding male at Oceano Dunes District. 3-36
Figure 3-4. Number of CLTE breeding pairs, nests, and fledglings at Oceano Dunes District, 1991–2023. 3-39
Figure 3-5. Estimated number of breeding pairs of CLTE at Oceano Dunes SVRA and Vandenberg Space Force Base, 1995–2023. 3-54
Figure 3-6. Five-year running average of breeding pairs of CLTE at Oceano Dunes SVRA. 3-55
Figure 3-7. Three-year running average of fledglings per breeding pair of CLTE at Oceano Dunes SVRA. 3-56

Figure 5-1. Three-year running average population size of breeding SNPL at Oceano Dunes District, management target, and range wide threshold that triggers additional conservation actions, 2005-2023.....5-108

Figure 5-2. Adaptive Management Process.....5-110

Maps

Map 1. HCP Area and Vicinity.....9-3

Map 2. HCP Area Overview.....9-4

Map 3. Land Use and Facilities.....9-5

Map 4. Land Use and Facilities Detail.....9-6

Map 5. Western Snowy Plover and California Least Tern Management.....9-7

Map 6. Recreational Restrictions.....9-8

Map 7. Riparian Maintenance Locations.....9-9

Map 8. Covered Activities Modifying Existing Operations and Facilities.....9-10

Map 9. Vegetation Types.....9-11

Map 10. Western Snowy Plover Breeding Habitat, Critical Habitat Unit, and Recovery Unit.....9-12

Map 11a. Western Snowy Plover Nesting Locations (2005-2023).....9-13

Map 11b. Western Snowy Plover Nesting Locations (2005-2012).....9-14

Map 11c. Western Snowy Plover Nesting Locations (2013-2019).....9-15

Map 11d. Western Snowy Plover Nesting Locations (2020-2023).....9-16

Map 12. California Least Tern Breeding and Foraging Habitat.....9-17

Map 13a. California Least Tern Nesting Locations (2005-2023).....9-18

Map 13b. California Least Tern Nesting Locations (2005-2012).....9-19

Map 13c. California Least Tern Breeding and Foraging Habitat (2013-2019).....9-20

Map 13d. California Least Tern Breeding and Foraging Habitat in the HCP Area (2020-2023).....9-21

Map 14a. Southwestern Pond Turtle Occurrences and Potential Habitat.....9-22

Map 14b. Southwestern Pond Turtle Occurrences and Potential Habitat, Focused on Developed Camping Sites within HCP Area.....9-23

Map 15. California Red-Legged Frog Occurrences, Potential Habitat, and Recovery Plan Unit in the HCP Area.....9-24

Map 16. Western Spadefoot Occurrences and Potential Habitat.....9-25

Map 17. Tidewater Goby Habitat and Critical Habitat.....9-26

Map 18. Modeled Plant Habitat in the HCP Area.....9-27

Map 19. Marsh Sandwort Occurrences in and near the HCP Area.....9-28

Map 20. La Graciosa Thistle Occurrences and Critical Habitat in and near the HCP Area.....9-29

Map 21. Surf Thistle Occurrences in and near the HCP Area 9-30
Map 22. Beach Spectaclepod Occurrences in and near the HCP Area 9-31
Map 23. Nipomo Mesa Lupine Occurrences in and near the HCP Area 9-32
Map 24. Gambel's Watercress Occurrences in and near the HCP Area 9-33
Map 25. Western Snowy Plover Habitat and Covered Activities.....9-34
Map 26. California Least Tern Habitat and Covered Activities.....9-35
Map 27. Southwestern Pond Turtle Habitat and Covered Activities 9-36
Map 28. California Red-Legged Frog Habitat and Covered Activities 9-37
Map 29. Western Spadefoot Habitat and Covered Activities.....9-38
Map 30. Tidewater Goby Habitat and Covered Activities.....9-39
Map 31. Modeled Plant Habitat and Covered Activities.....9-40

Appendices

Appendices are bound in a separate volume
Appendix A. Listed Species and Other Special-Status Species Not Included in the HCP
Appendix B. Superintendent's Orders and Other District Guidelines
Appendix C. Impacts to Covered Species from Recovery Permit Activities
Appendix D. Permits
Appendix E. Representative Photographs
Appendix F. 2024 Nesting Season Management Plan
Appendix G. 2023 SNPL and CLTE Breeding Season Report
Appendix H. Pesticide Information
Appendix I. SNPL Breeding Season Window Survey Protocol
Appendix J. Declining Amphibian Task Force Fieldwork Code of Practice

EXECUTIVE SUMMARY

Overview

Management and operation of Pismo State Beach and Oceano Dunes State Vehicular Recreation Area (SVRA), for which the California Department of Parks and Recreation (CDPR) has responsibility and authority, may negatively affect western snowy plover (*Charadrius nivosus nivosus*)[1], California least tern (*Sternula antillarum browni*), southwestern pond turtle (*Actinemys pallida*), California red-legged frog (*Rana draytonii*), western spadefoot (*Spea hammondii*), and tidewater goby (*Eucyclogobius newberryi*), as well as six state- and/or federally listed plant species. CDPR is committed to continuing its policy of avoidance and minimization of take[2] of listed species in management of Pismo State Beach and Oceano Dunes SVRA; however, it is anticipated that take of these biological resources will occur. Therefore, CDPR is preparing this Habitat Conservation Plan (HCP) as part of its application for an incidental take permit (ITP) authorized under section 10(a)(1)(B) of the federal Endangered Species Act (FESA).

CDPR's Off-Highway Motor Vehicle Recreation (OHMVR) Division is responsible for management, maintenance, administration, and operation of lands within SVRAs (Pub. Res. Code § 5090.32 (b)). The OHMVR Act of 2003 (Public Resources Code § 5090.01 et seq.) provides CDPR's mandate for off-highway vehicle (OHV) recreation. The Oceano Dunes District (District) HCP provides a framework for promoting the protection and recovery of natural resources, including endangered species, while facilitating take authorization for recreation management, natural resource management, maintenance, and planned development. The HCP will protect, enhance, and restore natural resources in Pismo State Beach and Oceano Dunes SVRA and contribute to the recovery of listed species. Rather than separately permitting and mitigating individual activities, the HCP evaluates natural-resource impacts and mitigation requirements comprehensively in a way that is more efficient and effective for at-risk species and their essential habitats.

The HCP provides the basis for U.S. Fish and Wildlife Service (USFWS) issuance of a 25-year permit authorizing incidental take of listed species under FESA. Separately, CDPR will also be seeking take authorization from the California Department of Fish and Wildlife (CDFW) for species listed under the California Endangered Species Act (CESA) pursuant to California Fish and Game Code Sections 2081 and 2800 et seq., including Section 2835[3]. USFWS will also provide assurances to CDPR that no further commitments of funds, land, or water will be required to address impacts on covered species beyond that described in the HCP.

Geographic Scope

The HCP area is the area in which CDPR is requesting authorization from the USFWS for take incidental to otherwise lawful activities of species covered in this HCP. The 5,005-acre HCP area includes Pismo State Beach and Oceano Dunes SVRA, located in San Luis Obispo County, California. The HCP area is

[1] =*Anarhynchus nivosus nivosus* (American Ornithological Society 2024).
[2] *Take*, as defined by FESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct." *Take*, as defined under CESA, is any action or attempt to "hunt, pursue, catch, capture, or kill."
[3] Section 2835 of the Fish and Game Code allows CDFW to authorize by permit the taking of any covered species, including those designated as fully protected species, whose conservation and management is provided for in a Natural Community Conservation Plan (NCCP) approved by CDFW.

bounded by the City of Pismo Beach to the north, the Guadalupe-Nipomo Dunes National Wildlife Refuge to the south, urban and agricultural land to the east, and the Pacific Ocean to the west. Primary access to the area is via U.S. Highway 101 and State Route 1.

Pismo State Beach and Oceano Dunes SVRA contain approximately 25 percent of the 18-mile linear shoreline of the overall Guadalupe-Nipomo Dunes complex. The Guadalupe-Nipomo Dunes complex extends from Pismo Beach south to Point Sal and roughly from State Route 1 to the Pacific Ocean in San Luis Obispo and Santa Barbara counties. The Guadalupe-Nipomo Dunes complex is a relatively intact coastal dune and dune scrub ecosystem varying in width from 2 to 5 miles.

The HCP area lands are owned by CDPR, except for 584 acres known as the La Grande property, which is owned by San Luis Obispo County; 34 acres owned by Union Oil; and approximately 658 acres owned by Phillips 66. The Phillips 66 land is closed to all public access. All of these lands are managed by the District.

Covered Activities

Covered activities under this HCP include all activities for which CDPR has responsibility within the covered lands that could result in take of covered animal species. These activities include, but are not limited to, public use/recreation management, natural resource management, and park/beach management.

Covered Species

This HCP includes 10 covered species, including 6 federally listed animal[4] and 6 federally listed plant species (Table ES-1). Species were selected for coverage based on their potential to be affected by covered activities, their occurrence in the HCP area, and the species' listing status. This HCP includes avoidance and minimization measures (AMMs) to protect all species selected for coverage under the HCP.

Conservation Program

CDPR will continue to manage the HCP area for covered species largely in the same manner that it has for over a decade. Avoidance and minimization of take of listed species will continue to be the primary objective. The conservation program will recover covered species in the HCP area by protecting and, where appropriate, enhancing their populations. The conservation program includes conservation measures (i.e., actions taken to avoid or minimize take, compensate for loss of habitat, or provide for the conservation of covered species) to achieve the biological goals and objectives set forth in the HCP. The conservation program relies on several types of conservation measures including AMMs, habitat enhancement, habitat restoration, habitat creation, and population enhancement. Recovery and protection of the covered species through the conservation program is accomplished by the following:

- Managing habitat components to benefit covered species
- Minimizing human alteration or disturbance of native habitats
- Reducing conflicts between covered species and park users

[4] Southwestern pond turtle and western spadefoot are proposed for federal listing but expected to be listed during the permit term.

- Restoring native habitats
- Monitoring the success of these efforts

Table ES-1. Species Proposed for Coverage

Species Common Name (*Scientific Name*)	Listing Status	
	State	Federal
Birds		
Western snowy plover (*Charadrius nivosus nivosus*[1])	CSSC	FT
California least tern (*Sternula antillarum browni*)	SE, SP	FE
Reptiles		
Southwestern pond turtle (*Actinemys pallida*)	CSSC[2]	FPT
Amphibians		
California red-legged frog (*Rana draytonii*)	CSSC	FT
Western spadefoot (*Spea hammondii*)	CSSC	FPT
Fish		
Tidewater goby (*Eucyclogobius newberryi*)	CSSC	FE[3]
Plants[4]		
Marsh sandwort (*Arenaria paludicola*)	SE	FE
La Graciosa thistle (*Cirsium scariosum* var. *loncholepis*)	ST	FE
Surf thistle (*Cirsium rhothophilum*)	ST	–
Beach spectaclepod (*Dithyrea maritima*)	ST	–
Nipomo Mesa lupine (*Lupinus nipomensis*)	SE	FE
Gambel's watercress (*Nasturtium* [*Rorippa*] *gambelii*)	ST	FE

Listing Status:
FE Federally listed as endangered
FT Federally listed as threatened
FPT Federally proposed as threatened
SE State listed as endangered
ST State listed as threatened
CSSC California species of special concern
SP California fully protected

Notes:
[1]=*Anarhynchus nivosus nivosus* (American Ornithological Society 2024).
[2]CDFW applies CSSC status to western pond turtle (*Emys marmorata*).
[3]On March 13, 2014, the USFWS proposed to downlist from federal endangered to threatened (79 FR 14339).
[4]Listed plants are addressed by this HCP, but no take authorization is requested from USFWS.
*Steelhead (*Oncorhynchus mykiss irideus*; South-Central California Coast Ecologically Significant Unit) is not proposed for coverage per letter from NOAA Fisheries (NOAA Fisheries 2008) concluding covered activities are not likely to take steelhead with the implementation of AMMs. See Appendix A for additional supporting factors.

Avoidance, Minimization, and Mitigation Measures

As required by FESA, the conservation program includes measures to avoid and minimize take of covered animal species, including mitigation as needed to offset incidental take. All covered activities must adhere to these measures in order to receive take authorization.

Adaptive Management and Monitoring

The conservation program contains detailed guidelines and recommendations for management, enhancement, and restoration techniques in the HCP area. The conservation program also contains a detailed monitoring and adaptive management program. Adaptive management is a process that allows flexible management, such that actions can be adjusted as uncertainties become better understood or as conditions change—a "learning by doing approach" that reduces the uncertainty inherent in resource management. Adaptive management should identify and address the uncertainty, incorporate a range of previously agreed-upon alternatives for addressing those uncertainties, integrate a monitoring program that detects the necessary information, and incorporate a feedback loop that links implementation and monitoring to a decision-making process that results in appropriate changes in management. Adaptive management will help CDPR achieve the biological goals and objectives of the HCP.

Implementation

CDPR is the Permittee. The HCP will be implemented by the Oceano Dunes District, with the District Superintendent having implementation responsibility and supported by District and other CDPR staff. The District Superintendent can issue orders addressing the covered activities, including:

- Temporary beach or other park area closures needed to protect wildlife resources.
- Strict enforcement of laws and regulations governing the park, including, but not limited to, no entry areas, dogs in prohibited areas, dogs off-leash in leash only areas, horses off trails, and motorized vehicle restrictions.
- Permanent closures of trails or beaches.

The District Superintendent will need assistance from OHMVR Division Headquarters and CDPR management in obtaining the necessary funding and providing overall support for the HCP.

CDPR and the District will be advised by representatives of the USFWS, other regulatory agencies (e.g., California Coastal Commission), and other resource specialists, as needed.

GLOSSARY

The following abbreviations and place name definitions are provided for terms used in this Habitat Conservation Plan.

A. ABBREVIATIONS AND TERMS

AMM	Avoidance and minimization measure
APAP	Aquatic pesticide application plan
ARWP	Annual Report and Work Plan
ASI	American Safety Institute
ATV	All-terrain vehicle
BMP	Biodiversity Management Plan
°C	Degrees Celsius
CalPoly	California Polytechnic State University San Luis Obispo
CalVTP	California Vegetation Treatment Program
CCBER	Cheadle Center for Biodiversity and Ecological Restoration
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW[5]	California Department of Fish and Wildlife
CDP	Coastal development permit
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CLTE	California least tern
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CSLRCD	Coastal San Luis Resource Conservation District
DPR	Department of Pesticide Regulation
District	Oceano Dunes District
Dunes Preserve	Pismo Dunes Natural Preserve

[5] As of January 1, 2013, the California Department of Fish and Game (CDFG) was renamed the California Department of Fish and Wildlife (CDFW). When this document cites reports prepared by the Department prior to 2013, the reference includes the prior department name of CDFG. Both CDFW and CDFG refer to the same agency.

eDNA	Environmental DNA
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FESA	Federal Endangered Species Act
GIS	Geographic Information System
HCP	Habitat conservation plan
IPM	Integrated pest management
ITP	Incidental take permit
LC50	Lethal concentration of a chemical causing 50 percent mortality of test animals
LD50	Lethal dose required to kill 50 percent of a population of test animals
LCSLO	Land Conservancy of San Luis Obispo
MCV2	Manual of California Vegetation
MIG	MIG, Inc.
MOU	Memorandum of Understanding
Mph	Miles per hour
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWS	National Weather Service
OHMVR	Off-highway motor vehicle recreation
OHV	Off-highway vehicle
PCA	Pest control adviser
PCE	Primary constituent element
Perimeter fence	The fence that delineates the eastern boundary of the area open to riding and/or camping.
PM	Particulate matter
Post	Orientation marker posts
PPM	Parts per million
PPT	Parts per thousand

PRBO[6]	PRBO Conservation Science
PWP	Public Works Plan
Recovery activities	Measures taken to enhance the propagation or survival of a listed species (e.g., monitoring). Recovery activity impacts to covered species are authorized by a 10(a)(1)(A) Recovery Permit.
RUV	Recreational utility vehicle
RV	Recreational vehicle
SAG	SOA Scientific Advisory Group
SHPO	State Historic Preservation Officer
SLOAPCD	San Luis Obispo County Air Pollution Control District
SNPL	Western snowy plover
SOA	Stipulated Order of Abatement
SVRA	State vehicular recreation area
TMDL	Total maximum daily loads
UAS	Unmanned Aircraft System; sometimes referred to as “drone”
USDA	U.S. Department of Agriculture
EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VSFB	Vandenberg Space Force Base
VT	Vegetated treatment
WHPP	Wildlife habitat protection plan
Wildlife Agencies	U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife

[6] As of June 5, 2013, PRBO Conservation Science (PRBO) was renamed Point Blue Conservation Science (Point Blue). When this document cites reports prepared prior to June 5, 2013, the reference includes the prior organization name of PRBO. Both PRBO and Point Blue refer to the same organization.

B. DESCRIPTION OF PLACE NAMES

48-acre foredune	Vegetation restoration area within the open riding area closed in January 2020 to improve air quality conditions. Fencing was installed to close 3 plots totaling approximately 48 acres (approximately 0.8 miles of shoreline) using unburied 4-foot-tall wire fencing that is not predator proof. The plots were given different experimental treatments using straw, native seed, and native plants. One control section was not treated. During the early stages of restoration, the treated plots had moderate amounts of plant cover, low topography, and areas of scattered straw. The adjacent shoreline and the area between the foredune and the northern boundary of the Southern Exclosure may be closed to the public using symbolic fence when SNPL or CLTE nests or broods are present to provide a contiguous closed shoreline.
6 Exclosure	The area (approximately 0.5 mile of shoreline and approximately 62 acres) within the Southern Exclosure from orientation marker post (Post) 6 to Post 7. Habitat includes areas of bare sand, small to medium sized hummocks, and limited areas of organic surface debris (shells, driftwood, dried algal wrack). Additionally, while the area was once sparsely vegetated, it has become more heavily vegetated in recent years (see note in Southern Exclosure description).
7 Exclosure	The area (approximately 0.4 mile of shoreline and approximately 63 acres) within the Southern Exclosure from Post 7 to the north side of the 8 Exclosure. Habitat within this exclosure includes areas of bare sand, extensive areas of small to medium sized vegetated hummocks, limited areas of organic surface debris (e.g., shells, driftwood, dried algal wrack), and areas of sparse to heavily vegetated dunes (see note in Southern Exclosure description), as well as moderate to heavy vegetation in a small vegetation island (7.5 Reveg).
8 Exclosure	The area (approximately 0.5 mile of shoreline and approximately 82 acres) of the Southern Exclosure from the south side of the 7 Exclosure to the North Oso Flaco Exclosure fencing south of Post 8. Habitat includes extensive areas of tall dunes with bare sand in the eastern portion, areas of moderate to tall vegetated foredune hummocks (see note in Southern Exclosure description), and limited areas of organic surface debris.

Arroyo Grande Creek	Seasonally flows into the Pacific Ocean approximately 1 mile south of Pier Avenue. The associated lagoon is variably located east of the area between Post 1 and Post 2. The upper creek and lagoon are closed to vehicle use year-round to protect sensitive aquatic habitat. Pedestrian and equestrian entry is prohibited during the breeding season for western snowy plover (SNPL) and California least tern (CLTE) but permitted during the non-breeding season. Posts and signs delineate the closed area during the non-breeding season and symbolic rope fencing is added during the breeding season.
Boneyard Exclosure	The area (approximately 92 acres) east of the North Oso Flaco Exclosure dunes and within the Southern Exclosure. Habitat is primarily bare sand and active sand dunes. This exclosure is inland and does not have a shoreline component. A portion of the west side (16 acres) has been closed year-round since 2005 due to the presence of a cultural resource in the area, and this area has developed small to large vegetated hummocks. The east fence is not maintained as a predator fence due to the rapidly shifting open sand dunes in the area. Beginning in 2003, an interior predator fence[7] was placed in the Boneyard Exclosure resulting in an approximately 44-acre western portion (West Boneyard Exclosure) that adjoins the 8 Exclosure and North Oso Flaco Exclosure and an approximately 47-acre eastern portion (East Boneyard Exclosure). See also the note in the Southern Exclosure description.
Carpenter Creek	Seasonally flows into the Pacific Ocean approximately 0.4 miles north of Grand Avenue and the riding area. Non-California Department of Parks and Recreation (CDPR) vehicles are not allowed in the area. CDPR vehicles are allowed in this area. The area receives a high level of pedestrian use.
Corporation yard	A developed area that includes the maintenance yard, ranger station, park employee residences, associated parking, and the storage area for pre-cast restroom buildings (CXTs).
Exclosures	The combined areas of the Southern Exclosure and North Oso Flaco Exclosure (approximately 368 acres). The areas include the seasonal exclosure fencing and the adjacent closed shoreline.
HCP area	The entire area (5,005 acres) for which incidental take coverage is sought, comprising Pismo State Beach, which includes Pismo Dunes Natural Preserve (Dunes Preserve) and Pismo Lake, and Oceano Dunes State Vehicular Recreation Area (SVRA), which includes the Oso Flaco Lake area.

[7] Wire fencing intended to keep predators and humans away from ground nests.

Midramps	Beach access route to Oceano Campground between Grand Avenue and Pier Avenue. Midramps is only open to CDPR vehicles.
North Oso Flaco Exclosure	The area (approximately 0.5 mile and approximately 68 acres, including shoreline) extending south from 8 Exclosure to the pedestrian boardwalk access trail that leads to the Oso Flaco shoreline. The area is closed to the public during the breeding season to protect nesting SNPL and CLTE with fencing of the foredunes and symbolic fencing of the shoreline portion. Note: CDPR administratively closed the North Oso Flaco shoreline in 2021 temporarily in response to now-concluded permitting and litigation. This HCP anticipates the area will return to seasonal operation.
Oceano Dunes District	Same as the HCP area. The Oceano Dunes District is operated and managed by CDPR, including the Off-Highway Motor Vehicle Recreation (OHMVR) Division of CDPR.
Oceano Dunes SVRA	Oceano Dunes SVRA (3,490 acres), which is operated and managed by CDPR/Oceano Dunes District.
Open riding area	Portion of Oceano Dunes SVRA and Pismo State Beach south of Post 2 (approximately 1,138 acres) open to off-highway motor vehicle (OHV) recreation and camping. This area changes in size based on seasonal restrictions.
Pismo Creek Lagoon	Seasonally flows into the Pacific Ocean approximately 0.6 miles north of Grand Avenue and the riding area. Standing water persists all year, with low vegetated hummocks west of the lagoon and tall vegetated dunes and housing to the east. Non-CDPR vehicles are not allowed in the area. The area receives a high level of pedestrian use. Only a small portion of the lagoon is part of State Park property. CDPR vehicles are allowed in this area.
Pismo Dunes Natural Preserve	Referred to as Dunes Preserve in this HCP. Subunit of Pismo State Beach (694 acres) that is open to pedestrians and equestrians and closed to all vehicular traffic and dogs.
Pismo Lake	A subunit of Pismo State Beach. The Pismo Lake property was acquired in 2007. No management plan or future development design is currently in effect for the area.
Pismo State Beach	A state beach (approximately 1,515 acres) operated and managed by CDPR/Oceano Dunes District.

Riding area	The approximately 1,208-acre portion of the HCP area open to vehicles. This area changes in size based on seasonal restrictions. The 65-acre corridor along the shoreline from Grand Avenue to Post 2 only allows street-legal vehicles, e.g., vehicles equipped and licensed for use on public roads, and is closed to camping. Street-legal vehicles are allowed along up to approximately 5.3 miles of beach, from the Grand Avenue entrance to the southern boundary of the open riding area (approximately 0.4 mile south of Post 8). OHVs and camping are only allowed south of Post 2 in the open riding area.
Sand highway	Commonly traveled route into the dunes at Oceano Dunes SVRA. The route runs from south of Post 4 to the southern boundary of the open riding area. It is marked with numbered signs for navigation.
Seasonal exclosure	The contiguous area enclosed by the predator fencing to protect SNPL and CLTE during the breeding season within the Southern Exclosure (approximately 160 acres in predator fencing) and North Oso Flaco Exclosure (approximately 56 acres in predator fencing). The seasonal exclosure does not include the shorelines of the Southern Exclosure, North Oso Flaco, or South Oso Flaco or the East Boneyard area. The combined area of the Southern Exclosure and North Oso Flaco, including the adjacent shoreline, is referred to as “Exclosures” in this document.
Southern Exclosure	A single contiguous area, including adjacent shoreline above the high tide line, within the southern portion of the open riding area comprising the 6, 7, 8, and Boneyard Exclosures that is closed to entry during the breeding season to protect nesting SNPL and CLTE. This approximately 300-acre area includes a portion of the seasonal exclosure with predator fencing, the eastern Boneyard area without predator fencing, and the shoreline with symbolic fence. From 2001 to 2004, the amount of seasonally protected nesting habitat in the riding area periodically increased in size. Subsequent to 2004 there has been very little change in size of this protected area. Note: CDPR administratively closed this area in 2021 temporarily in response to now-concluded permitting and litigation. This HCP anticipates the area will return to seasonal operation if such operation is consistent with the requirements of other programs.
South Oso Flaco	The area (approximately 1.2 miles of shoreline) that extends from the boardwalk to the southern boundary of Oceano Dunes SVRA. Oso Flaco Lake drains through Oso Flaco Creek, and the mouth of this creek is within the northern portion of South Oso Flaco. Symbolic fencing is used in this area during the breeding season instead of predator fencing to close off the upper beach and dune habitat. The shoreline remains open to the public.

Trails	Oceano Dunes District trails include the Beach Boardwalk, Grand Dunes, Oceano Lagoon, and Oso Flaco Boardwalk trails. The Grand Dunes Trail is an informal path.
Vegetation islands	Pockets of vegetation, which are closed to vehicles using fencing or poles with signs, composed largely of central coastal dune scrub, willow thicket, and dune swale found in hollow pockets in active coastal dunes. There are approximately 17 vegetation islands in Oceano Dunes SVRA, including Moymell, Pavilion Hill, Worm Valley, 48-acre foredune (3 plots), BBQ Flats, BBQ Flats South, Bigfoot, Eucalyptus North, Eucalyptus Tree, Belly Button, Bigmac, Boy Scout Camp, Surprise, 7.5 Reveg, and Pipeline Reveg. Pedestrians are allowed within these areas, although entry into the area is not encouraged because designated access points have not been established.

Chapter 1. Introduction and Background

1.1 Overview and Background

The California Department of Parks and Recreation (CDPR) has numerous parks within San Luis Obispo County encompassing large sections of the central California coastline, extensive watersheds, and upland terrestrial environments. This Habitat Conservation Plan (HCP) focuses on Pismo State Beach and Oceano Dunes State Vehicular Recreation Area (SVRA), administered by the Oceano Dunes District (District). While together these parks protect tracts of largely open, undeveloped lands, they are set within a geographic context of urban development typical of the California coast.

The mission of CDPR is to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. Balancing the need to protect California's natural resources, while providing recreational access to the parks, requires the development of sound management strategies that are based on the best available scientific, demographic, and economic information. This is particularly important considering the number of endangered plant and animal species that use these parks as a last safe refuge at the same time that a growing population puts increasing demand on parks.

CDPR's Off-Highway Motor Vehicle Recreation (OHMVR) Division is responsible for management, maintenance, administration, and operation of lands within SVRAs (Pub. Res. Code § 5090.32 b)). The OHMVR Act of 2003 (Public Resources Code § 5090.01 et seq.) provides CDPR's mandate for off-highway vehicle (OHV) recreation. The OHMVR Division is charged with administering the state's OHMVR Program to provide high quality OHV recreation opportunities and to address the effects inherent with those activities. The mission of the OHMVR Division is to provide leadership statewide in the area of OHV recreation; to acquire, develop, and operate state-owned vehicular recreation areas; and to otherwise provide for a statewide system of managed OHV recreational opportunities through funding to other public agencies. The OHMVR Division works to ensure that quality recreational opportunities remain available for future generations by providing for education, conservation, and enforcement efforts that balance OHV recreation impacts with programs that conserve and protect cultural and natural resources (CDPR 2009a).

The purpose of this HCP is to describe the measures the District will undertake to avoid, minimize, and mitigate specified visitor- and park operations-related impacts to several listed species. Avoidance and minimization of take of listed species will continue to be the primary objective. Consistent with CDPR's and OHMVR Division's missions, this HCP is designed to accommodate recreational use within the covered parks while protecting and benefiting numerous populations of threatened and endangered species occurring within those parks.

1.1.1 Purpose and Goals

This HCP is part of a conservation effort initiated by the OHMVR Division to protect, conserve, and restore the natural resources of Pismo State Beach and Oceano Dunes SVRA while allowing CDPR to continue to operate the park units for public use and enjoyment consistent with unit classifications. The primary goals of the HCP's conservation program are to provide habitat-level protection and management and to minimize human-related impacts to key threatened or endangered wildlife,

including the western snowy plover (SNPL; *Charadrius nivosus nivosus*[8]), California least tern (CLTE; *Sternula antillarum browni*), southwestern pond turtle (*Actinemys pallida*), California red-legged frog (CRLF; *Rana draytonii*), western spadefoot (*Spea hammondii*), tidewater goby (*Eucyclogobius newberryi*), and six state- and/or federally listed plant species. The protection and management actions implemented for these "covered species" will benefit a host of other plant and animal species that inhabit the same habitats.

This HCP provides mitigation and avoidance and minimization measures (AMMs) that will enhance the long-term probability of survival for the covered species within the HCP area. This will be accomplished by:

- Managing habitat components to benefit the covered species
- Minimizing human alteration or disturbance of native habitats
- Reducing conflicts between covered species and park users
- Restoring native habitats
- Monitoring the success of these efforts

This HCP will provide the basis for issuance of an incidental take permit (ITP) issued by the U.S. Fish and Wildlife Service (USFWS) pursuant to section 10(a)(1)(B) of the federal Endangered Species Act (FESA) of 1973, as amended. The HCP, which is a priority objective of management, establishes allowable levels of incidental take of the covered animal species that may occur as an unintended result of otherwise lawful activities of park visitors and/or park staff and describes measures to minimize and mitigate the incidental take to the maximum extent practicable.

1.2 Permit Holder/Permit Term

CDPR is the Permittee. The HCP will be implemented by the Oceano Dunes District, with the District Superintendent having implementation responsibility and supported by District staff, including Natural Resource staff and State Park Peace Officers (Rangers, State Park Ranger). Note: Because there are various full-time and part-time Natural Resource classifications within Oceano Dunes District (Environmental Scientist, Senior Environmental Scientist, Park Aide, Forestry Aide etc.), the HCP refers to anyone who possesses the skills to do a particular task correctly within the HCP area as qualified biologist/Natural Resource Staff. Furthermore, the District Superintendent will need assistance from OHMVR Division Headquarters to obtain adequate annual budgets to implement the conservation program.

The term of the section 10(a)(1)(B) permit shall be 25 years with a report on the program produced annually. The annual report will evaluate the performance and effectiveness of the HCP and will be subject to review by the USFWS (section 5.6). The ITP covers ongoing activities (e.g., recreation, operations, maintenance, natural resources management) and new activities (e.g., SNPL egg and chick capture for captive rearing if they are observed to be threatened by covered activities, listed plant propagation and outplanting, mechanical trash removal, cable fence replacement, Pismo Creek estuary seasonal floating bridge, a limited trail riding area, new dust control activities, Oso Flaco boardwalk replacement, special projects, exclosure reduction, and use of unmanned aircraft systems [UAS]) in the Oceano Dunes District that are expected to exist in perpetuity. These activities are also expected to

[8] =*Anarhynchus nivosus nivosus* (American Ornithological Society 2024).

potentially affect the covered species in perpetuity, so CDPR requires take authorization for these activities as long as feasible. The 25-year term has been chosen as an appropriate balance between 1) management need and 2) foreseeability of both covered activities and conservation program outcomes. The longstanding management program for SNPL and CLTE, for example, illustrates the effectiveness of the protocols incorporated into this HCP.

1.3 Permit Boundary/Covered Lands

This HCP covers two coastal parks managed by CDPR located in San Luis Obispo County, California (Map 1). The 5,005-acre HCP area comprises Pismo State Beach and Oceano Dunes SVRA. Covered park unit lands comprise state beach, natural preserve, and SVRA (see section 1.5.8). Pismo Dunes Natural Preserve is a subunit within Pismo State Beach. The HCP area is bounded by the City of Pismo Beach to the north, the Guadalupe-Nipomo Dunes National Wildlife Refuge to the south, urban and agricultural land to the east, and the Pacific Ocean to the west. Primary access to the area is via U.S. Highway 101 and State Route 1 (Map 2).

Pismo State Beach and Oceano Dunes SVRA comprise approximately 25 percent of the 18-mile linear shoreline of the overall Guadalupe-Nipomo Dunes complex. The Guadalupe-Nipomo Dunes complex extends from Pismo Beach south to Point Sal, and roughly from State Route 1 to the Pacific Ocean, in San Luis Obispo and Santa Barbara counties. The Guadalupe-Nipomo Dunes complex is a relatively intact coastal dune and dune scrub ecosystem varying in width from 2 to 5 miles.

The HCP area lands are owned by CDPR, except for 584 acres known as the La Grande property, which is owned by San Luis Obispo County; 34 acres owned by Union Oil; and approximately 658 acres owned by Phillips 66. The land owned by Phillips 66 is closed to all public access. All of these lands are managed by the Oceano Dunes District.

The following discussion gives an overview of each park unit within the HCP area. Details of park operations and resources are provided in subsequent chapters.

1.3.1 Pismo State Beach

Pismo State Beach includes four somewhat distinct areas: the beach area; Pismo Dunes Natural Preserve (Dunes Preserve); Pismo Lake; and a developed portion, including two campgrounds, a golf course with restaurant, corporation yard (ranger station/maintenance yard), and park residence area (Map 3). The entire Pismo State Beach unit is approximately 1,515 acres and is adjacent to the cities of Pismo Beach and Grover Beach and the community of Oceano. The City of Pismo Beach has operated the northern portion of the state beach (i.e., from approximately Addie Street to the northern CDPR boundary) in accordance with an operating agreement in place since 1951. Although the City of Pismo Beach operates this portion of the state beach, when needed, CDPR staff assist with lifeguard operations on the City-operated beach, and CDPR Natural Resource staff conduct resource work in this area.

Some areas of Pismo State Beach are closed to vehicles; some areas are open to street-legal vehicles only, while other areas are open to OHVs and street-legal vehicles. The portion of Pismo State Beach north of Grand Avenue is closed to non-CDPR vehicles. The public is allowed to drive motorized vehicles through Pismo State Beach south of Grand Avenue to access Oceano Dunes SVRA. Visitors and CDPR staff can also drive onto the beach via sand ramps at the western terminuses of Grand Avenue and Pier Avenue (Map 2). Motorized vehicles, including OHVs, are allowed on the portion of Pismo State Beach south of orientation marker post (Post) 2 (Map 3). CDPR staff also have access to the beach via an entrance from Oceano Campground, which is north of Pier Avenue (i.e., Midramps; Map 4).

The Dunes Preserve is a 695-acre subunit of Pismo State Beach with undisturbed sand dunes, dune slack, and freshwater wetlands. The Dunes Preserve begins at the south bank of Arroyo Grande Creek. Its southern boundary is shared with Oceano Dunes SVRA. It is bounded on the west by the seaward toe of the foredune at Pismo State Beach. Pedestrian and equestrian use is permitted in the Dunes Preserve, but vehicles and dogs are not allowed.

The 70-acre Pismo Lake area is inland of and disconnected from the rest of Pismo State Beach. Pismo Lake is not officially closed to the general public, but public visitation is not encouraged because designated access points have not been established, and the area is treated as closed in this HCP. No management plan or future development design is currently in effect for the area.

1.3.2 Oceano Dunes State Vehicular Recreation Area

Oceano Dunes SVRA is 3,490 acres and is contiguous with Pismo State Beach. As a result, the vehicle operations at Pismo State Beach and Oceano Dunes SVRA are managed as an SVRA. As noted above, motorized vehicles access Oceano Dunes SVRA via sand ramps in Pismo State Beach at Grand Avenue and Pier Avenue (Map 2). Between the two park units (i.e., Pismo State Beach and Oceano Dunes SVRA), approximately 1,100 acres[9] allow OHV use in what is called the "open riding area." Almost 2,200 acres of Oceano Dunes SVRA outside of the open riding area are maintained in a largely natural state. A portion of Oceano Dunes SVRA, mostly south and southeast of the open riding area, is a pedestrian-only area that can be accessed from Oso Flaco Lake Road off State Route 1, as well as from an entrance from the open riding area at Boneyard (Map 5). This area can also be accessed from the shoreline during the non-breeding season for SNPL and CLTE when shoreline access is not restricted by fencing (i.e., Exclosures) erected by CDPR to protect breeding SNPL and CLTE.

The Phillips 66 leasehold lies between the open riding area and communities east of Oceano Dunes SVRA; it is closed to all visitors. Oceano Dunes District manages the leasehold area (e.g., maintains fences and manages resources), as needed. This area can be used for emergency access. Phillips 66 maintains the road through the leasehold property to ensure access for pipeline maintenance.

The state leases some Oceano Dunes SVRA land to local agricultural operators (Map 3) near Oso Flaco Lake. This 211-acre leased portion of Oceano Dunes SVRA is also included in this HCP.

1.4 Species to be Covered by the Permit

Covered species were chosen based on their listing or potential listing status as a federally listed threatened or endangered species and the potential for take within the HCP area. Table 1-1 lists the species addressed by this HCP. Four of these species are listed animals, six are listed plants, and two are proposed for listing. Although FESA does not prohibit take of listed plant species, CDPR has included them in this HCP and requests assurances for them under USFWS's "No Surprises" assurances rule, discussed in section 6.5.2.

In addition to the covered species, other special-status species have either been documented within 5 miles of the HCP area and/or are included on the USFWS Resource Report for the HCP area. Appendix A lists these species along with an explanation as to why each species is not included as a covered species.

[9] Includes approximately 300 acres of riding area seasonally closed March 1–September 30 for SNPL and CLTE nesting (Southern Exclosure).

These or other species could be added to the ITP via an amendment to the HCP if they become listed and/or otherwise require incidental take authorization during the duration of the permit.

Table 1-1. Species Proposed for Coverage

Species Common Name (*Scientific Name*)	Listing Status	
	State	Federal
Birds		
Western snowy plover (*Charadrius nivosus nivosus*[1])	CSSC	FT
California least tern (*Sternula antillarum browni*)	SE, SP	FE
Reptiles		
Southwestern pond turtle (*Actinemys pallida*)	CSSC[2]	FPT
Amphibians		
California red-legged frog (*Rana draytonii*)	CSSC	FT
Western spadefoot (*Spea hammondii*)	CSSC	FPT
Fish		
Tidewater goby (*Eucyclogobius newberryi*)	CSSC	FE[3]
Plants[4]		
Marsh sandwort (*Arenaria paludicola*)	SE	FE
La Graciosa thistle (*Cirsium scariosum* var. *loncholepi*s)	ST	FE
Surf thistle (*Cirsium rhothophilum*)	ST	–
Beach spectaclepod (*Dithyrea maritima*)	ST	–
Nipomo Mesa lupine (*Lupinus nipomensis*)	SE	FE
Gambel's watercress (*Nasturtium* [*Rorippa*] *gambelii*)	ST	FE

Listing Status:

FE Federally listed as endangered	SE	State listed as endangered
FT Federally listed as threatened	ST	State listed as threatened
FPT Federally proposed as threatened	CSSC	California species of special concern
	SP	California fully protected

Notes:

[1]=*Anarhynchus nivosus nivosus* (American Ornithological Society 2024).

[2]CDFW applies CSSC status to western pond turtle (*Emys marmorata*).

[3]On March 13, 2014, the USFWS proposed to downlist from federal endangered to threatened (79 FR 14339).

[4]Listed plants are addressed by this HCP, but no take authorization is requested from USFWS.

*Steelhead (*Oncorhynchus mykiss irideus*; South-Central California Coast Ecologically Significant Unit) is not proposed for coverage per letter from National Oceanic and Atmospheric Administration (NOAA) Fisheries (NOAA Fisheries 2008) concluding covered activities are not likely to take steelhead with the implementation of AMMs. See Appendix A for additional supporting factors.

1.5 Regulatory Framework

1.5.1 Federal Endangered Species Act

Section 9 of FESA and federal regulation pursuant to 4(d) of the FESA as applicable to species currently under consideration for coverage under this HCP, prohibit the take of endangered and threatened species, respectively, without exemption. *Take* is defined as to harass, harm, pursue, hunt, shoot,

wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.[10] *Incidental take* is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (50 CFR §17.3). Pursuant to the Principal Deputy Director's Memorandum (USFWS 2018a), harassment is not a form of take permitted under section 10(a)(1)(B) since it is not incidental take and is instead an intentional or negligent act.

Pursuant to FESA section 11(a) and (b), any person who knowingly violates section 9 or any permit, certificate, or regulation related to section 9 may be subject to civil or criminal penalties for each violation and/or imprisonment.

Individuals and state and local agencies proposing an action that is expected to result in the take of federally listed animal species are encouraged to apply for an ITP under FESA section 10(a)(1)(B) to be in compliance with the law. Such permits are issued by the USFWS when take is not the intention of and is incidental to otherwise legal activities. An ITP application must be accompanied by an HCP. The regulatory standard under section 10(a)(1)(B) is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under section 10(a)(1)(B), a proposed project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured.

FESA section 10(a)(1)(A) Recovery Permits are issued to allow for take resulting from activities intended to foster the recovery of listed species. A typical use of a 10(a)(1)(A) Recovery Permit is to allow for scientific research on a listed species in order to better understand the species' long-term survival needs.

Section 3 of FESA provides for the designation of critical habitat for listed species. Section 3 defines critical habitat as: (i) the specific areas within the geographical area occupied by the species at the time it is listed on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon determination that such areas are essential for the conservation of the species. The term "conservation" is defined in section 3 as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." Therefore, critical habitat includes biologically suitable areas necessary for recovery of the species. Critical habitat may also include an area that is not currently occupied by the species but that will be needed for its recovery.

Section 7 of FESA requires federal agencies to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species' critical habitat. "Jeopardize the continued existence of…" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 Code of Federal Regulations [CFR] §402.02). "Destruction or adverse modification…" means "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include … those that alter the physical or biological features essential to

[10] As of the date of Draft HCP preparation, "harm" is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, or sheltering. (50 CFR §17.3)

the conservation of a species or that preclude or significantly delay development of such features" (50 CFR §402.02). USFWS issuance of an ITP under FESA section 10(a)(1)(B) is a federal action subject to FESA section 7. As a federal agency issuing a discretionary permit, the USFWS is required to consult with itself (i.e., conduct an internal consultation). Delivery of the HCP and a section 10(a)(1)(B) permit application initiates the section 7 consultation process within the USFWS.

The requirements of section 7 and section 10 substantially overlap. In the section 7 analysis, the Service must evaluate the effects of the action and cumulative effects on the listed species or critical habitat. Cumulative effects are effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area, pursuant to FESA section 7(a)(2). The action area is defined by the area that encompasses all consequences of the action. The action area may or may not be solely contained within the HCP boundary. These additional analyses are included in this HCP to meet the requirements of section 7 and to assist the USFWS with its internal consultation.

1.5.2 The Section 10(a)(1)(B) Process – Habitat Conservation Plan Requirements and Guidelines

The section 10(a)(1)(B) process for obtaining an ITP has three primary phases: 1) the HCP development phase; 2) the formal permit processing phase; and 3) the post-issuance phase.

During the HCP development phase, the project applicant prepares a plan that integrates the proposed project or activity with the protection of listed species. An HCP submitted in support of an ITP application must include the following information:

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested;
- Measures that will be implemented to monitor, minimize, and mitigate impacts; funding that will be made available to undertake such measures; and procedures to deal with unforeseen circumstances;
- Alternative actions considered that will not result in take; and
- Additional measures the USFWS may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes and the permit processing phase begins when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of 1) an HCP, 2) an Implementing Agreement, if applicable, 3) a permit application, and 4) a $100 fee from the applicant. The USFWS must publish a Notice of Availability of the HCP package in the Federal Register to allow for public comment. The USFWS also prepares an Intra-Service section 7 Biological Opinion and prepares a Set of Findings, which evaluates the section 10(a)(1)(B) permit application in the context of permit issuance criteria (see below). An Environmental Action Statement, Environmental Assessment, or Environmental Impact Statement serves as the USFWS's record of compliance with the National Environmental Policy Act (NEPA), which goes out for a 30-day, 60-day, or 90-day public comment period. A section 10(a)(1)(B) ITP is granted once the USFWS determines that all requirements for permit issuance have been met. Statutory criteria for issuance of the permit specify that:

- The taking will be incidental;
- The impacts of incidental take will be minimized and mitigated to the maximum extent practicable;

- Adequate funding for the HCP and procedures to handle unforeseen circumstances will be provided;
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild;
- The applicant will provide additional measures that the USFWS requires as being necessary or appropriate; and,
- The USFWS has received assurances, as may be required, that the HCP will be implemented.

During the post-issuance phase, the Permittee and other responsible entities implement the HCP, and the USFWS monitors the Permittee's compliance with the HCP as well as the long-term progress and success of the HCP. The public is notified of permit issuance by means of the Federal Register.

1.5.3 California Endangered Species Act

Section 2080 of the California Fish and Game Code prohibits "take" of any species that the California Department of Fish and Wildlife (CDFW) determines to be an endangered species or a threatened species, except as otherwise provided. *Take* is defined in section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Unlike FESA, the definition of take under CESA does not include harm or harassment. Like FESA, CESA allows for take incidental to otherwise lawful activities.

Section 2081 of the California Fish and Game Code allows CDFW to authorize acts that are otherwise prohibited pursuant to section 2080 of the California Fish and Game Code. Section 2081(a) allows CDFW to authorize the import, export, take, or possession of endangered, threatened, or candidate species through a permit or memorandum of understanding for scientific, educational, or management purposes. Section 2081(b) allows CDFW to authorize take that is incidental to an otherwise lawful activity. Section 2835 of the California Fish and Game Code allows CDFW to authorize by permit the taking of any covered species, including those designated as fully protected species, whose conservation and management is provided for in a Natural Community Conservation Plan (NCCP) approved by CDFW. CDPR is currently in the preliminary stages of preparing an NCCP to comply with CESA. The NCCP will include take coverage for CLTE and the six state-listed plants included in this HCP.

In addition to the initial stages of NCCP preparation, since 2021 CDPR has collaborated with CDFW on a Biodiversity Management Plan (BMP), which addresses certain aspects of motorized recreation within the SVRA and associated resource management considerations (CDFW 2021). The BMP is not a permitting vehicle but provides CDFW's recommendations for measures to protect SNPL, CLTE, aquatic resources, and listed plants, serving as an interim approach to managing species and habitats during the development of an NCCP. BMP measures are noted in the HCP where relevant.

1.5.4 State of California Fully Protected Species

In the 1960s, the State of California first began to designate "fully protected" species prior to the creation of CESA and FESA. Some fully protected species are also listed as threatened or endangered species under the FESA and/or CESA. California Fish and Game Code sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) designate certain species as fully protected species and provide that fully protected species may not be taken or possessed (section 1.5.3), except pursuant to an approved NCCP; a permit from CDFW for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species; or for certain specified projects (e.g., Fish & Game Code § 2081.15). CDFW cannot authorize take or possession of fully protected species for

necessary scientific research if that research is conducted in connection with mitigation for a project (Fish and Game Code §§ 3511, 4700, 5050, and 5515).

1.5.5 National Environmental Policy Act and California Environmental Quality Act

The purpose of NEPA is two-fold: to ensure that federal agencies examine environmental impacts of their actions (in this case deciding whether to issue an ITP) and to facilitate public participation. NEPA serves as an analytical tool on direct, indirect, and cumulative impacts of the proposed project alternatives to help the USFWS decide whether to issue an ITP. NEPA analysis must be conducted by the USFWS for each HCP as part of the ITP application process. To fulfill this requirement, an Environmental Assessment has been prepared for this HCP.

OHMVR Division's adoption of this HCP is also a project subject to California Environmental Quality Act (CEQA) compliance. Similar to NEPA, the CEQA analysis considers the potential impacts of adopting the HCP and issuing the permit on the environment. To satisfy this requirement, an Environmental Impact Report has been prepared for this HCP.

1.5.6 National Historic Preservation Act

All federal agencies are required to examine the impacts of their actions (e.g., issuance of a permit) on cultural resources. This may require consultation with the State Historic Preservation Officer (SHPO) and appropriate American Indian tribes. All ITP applicants are requested to submit a Request for Cultural Resources Compliance form to the USFWS. To complete compliance, the applicants may be required to hire contractors to conduct cultural resource surveys and possibly mitigate impacts to those resources.

1.5.7 Superintendent's Orders

The California Public Resources Code requires CDPR to protect units within the state park and SVRA systems from damage (Pub. Res. Code § 5008 (a)). To that end, local districts may establish rules and regulations specific to individual units (Pub. Res. Code § 5003, 14 California Code of Regulations [CCR] § 4326 (a)). Such local rules and regulations are commonly referred to as Superintendent's Orders. Superintendent's Orders must be posted in a location convenient for public review at district headquarters and at the affected unit (14 CCR § 4301 (i)). Violating CDPR rules and regulations, including a properly posted order, is a misdemeanor (Pub. Res. Code § 5008 (d)). All rangers are authorized to enforce rules and regulations (Pub. Res. Code § 5008 (b)).

The following orders[11] are currently in effect within the Oceano Dunes District and are relevant to this HCP (Appendix B):

- 554-003-2024 Kite Boarding/Surfing – specifies restrictions on kiteboarding and kite surfing; prohibits all devices propelled by a kite or sail over land
- 554-004-2024 Refuse Disposal – prohibits importing waste into the Oceano Dunes District, disturbing trash containers, and dumping hazardous materials

[11] Superintendent's Orders are regularly evaluated and updated as conditions change and based on operational needs. Because they are subject to change, the numbers and titles associated with the Superintendent's Orders will likely change during the HCP term. However, the subject matter will continue to be addressed within the new Superintendent's Orders. In addition, Superintendent's Orders can be updated or added due to new or changed circumstances as part of the adaptive management process (section 5.5).

- 554-005-2024 Vehicle Operation – specifies restrictions on motor vehicle operation throughout the District, including vehicular crossings of Arroyo Grande Creek
- 554-007-2024 Motor Vehicle Use Fee – requires payment of fees for motor vehicle entry
- 554-008-2024 Campfires – governs location, size, fuel, and burn hours
- 554-012-2024 Oso Flaco parking – closes parking lot between sunset and 7 a.m.
- 554-017-2024 Dogs – specifies restrictions on dogs throughout the District, including requiring dogs to be leashed and prohibiting dogs in Pismo Dunes Natural Preserve and the Oso Flaco Lake area
- 554-022-2024 Drones – specifies prohibited and approved drone use areas, including nesting season restrictions
- 554-026-2024 Kites – specifies prohibited and approved kite use areas, including nesting season restrictions
- 554-032-2024 E-Bikes – specifies prohibited and approved e-bike use areas
- 554-033-2024 Restricted Areas – governs public access restrictions based on posted signs and fencing
- 554-034-2024 Day Use – prohibits camping north of Post 2 and specifies timing of vehicular use
- 554-035-2024 Restricted Areas – specifies areas closed for nesting and prohibits camping or parking within 100 feet of the Southern Exclosure

1.5.8 Park Designations

The two park units, and portions thereof, covered by the HCP fall under three different classifications: Natural Preserve (Pub. Res. Code § 5019.17), State Beach (Pub. Res. Code § 5019.56(c)), and SVRA (Pub. Res. Code § 5090.43). The California Public Resources Code describes these classifications and prescribes management and operations guidelines specific to each classification.

1.5.8.1 Natural Preserves

Natural preserves consist of distinct areas of outstanding natural or scientific significance established within the boundaries of State Park System units. The purpose of natural preserves is to preserve features (e.g., rare or endangered plant and animal species and their supporting ecosystems) that are representative examples of plant or animal communities existing in California prior to the impact of civilization, geological features illustrative of geological processes, significant fossil occurrences or geological features of cultural or economic interest, or topographic features illustrative of representative or unique biogeographical patterns. Habitat manipulation is permitted only in those areas of a natural preserve found by scientific analysis to require manipulation to preserve the species or associations that constitute the basis for establishing the natural preserve (Pub. Res. Code § 5019.71). The public is prohibited from bringing motor vehicles into natural preserves (Pub. Res. Code § 5001.8 (a); CCR § 4351).

1.5.8.2 State Beaches

State beaches are a subset of state recreation units, which consist of areas selected, developed, and operated to provide outdoor recreational opportunities. When planning improvements to be undertaken within state recreation units, compatibility of the design with the surrounding scenic and environmental characteristics must be considered. State beaches consist of areas with frontage on the

ocean or bays designed to provide swimming, boating, fishing, and other beach-oriented recreational activities.

1.5.8.3 State Vehicular Recreation Areas

SVRAs consist of areas selected, developed, and operated to provide OHV recreation opportunities. SVRAs must be developed, managed, and operated for the purpose of providing the fullest appropriate public use of the vehicular recreational opportunities present in accordance with the OHMVR Act, while providing for the conservation of cultural resources and the conservation and improvement of natural resource values over time (Pub. Res. Code § 5090.43 (a)). To protect natural and cultural resource values, CDPR may establish sensitive areas within SVRAs. If OHV use results in damage to any natural or cultural resources or damage within sensitive areas, appropriate measures must be taken to protect these lands from any further damage. These measures may include erecting physical barriers and must include restoring natural resources and repairing damage to cultural resources (Pub. Res. Code § 5090.43).

1.5.9 Existing General Plan and Other Plans

General plans, formerly referred to as general development plans, set forth policies governing each park unit. The Pismo State Beach and Pismo [Oceano] Dunes SVRA General Development Plan and Resource Management Plan was approved in April 1975 (CDPR 1975). The following section lists applicable general development plan policies and other resource protection plans relevant to the HCP.

1.5.9.1 Pismo State Beach

The General Development Plan provides the following Declarations of Purpose and Management Policy for the state beach (note that camping on the beach is no longer permitted in the park north of Post 2):

> *Declaration of Purpose*. The purpose of Pismo State Beach is to make available to the people an outstanding coastal area of beach and sand dunes located in and southward from the City of Pismo Beach in San Luis Obispo County. Specific recreational activities to be perpetuated and provided for include the aesthetic enjoyment of dunes and shore; beach vehicular travel, when consistent with the perpetuation of the natural values; camping, both in established inland facilities and on the beach in appropriate zones; fishing and clamming under appropriate applicable regulations; and walking or riding horseback in the sand dune areas.
>
> *Declaration of Management Policy*. Pismo State Beach will be managed by CDPR to perpetuate and enhance the recreational opportunities afforded by this outstanding coastline, together with the scenic and natural features upon which such recreational opportunities depend; to regulate the various uses in the interest of the safety and enjoyment of visitors; and to coordinate the various activities and uses in such a way that the resources of the area are protected and perpetuated to ensure their continuous availability to the people. All activities within Pismo State Beach shall be carried out under the guidelines established by the Resource Management Directives of CDPR.

The General Development Plan provides separate Declarations of Purpose and Management Policy for the Dunes Preserve as follows:

> *Declaration of Purpose*. Pismo Dunes Natural Preserve is established to perpetuate in essentially natural condition a substantial tract of sand dunes in an area where they attain outstanding development and where they may easily be visited and enjoyed by interested persons. Full protection is also afforded to all archaeological sites located within the unit and to all natural vegetation and wildlife occurring within it.

> *Declaration of Management Policy*. CDPR will manage Pismo Dunes Natural Preserve in accordance with the Public Resources Code and with the CDPR Resource Management Directives. It will be kept free not only of roads, structures, and other facilities, but also of dune stabilization projects of all kinds. Motorized vehicles of any type, except in cases of extreme emergency, are prohibited.

The General Development Plan has been amended twice. In 1982 it was amended to allow for the Grover Beach Lodge at Grand Avenue (CDPR 1982). It was amended again in 1994 (CDPR 1994a) to reflect the results of the Pismo [Oceano] Dunes SVRA Access Corridor Project, which concluded that the Grand Avenue and Pier Avenue entrances were the Environmentally Preferred alternative, together with the staging area that remains in use today (CDPR 1994b).

1.5.9.2 Oceano Dunes SVRA

The General Development Plan provides the following Declarations of Purpose and Management Policy for Oceano Dunes SVRA:

> *Declaration of Purpose*. … [Oceano] Dunes SVRA is established to make available to the people opportunities for recreational use of OHVs in a large area of unstabilized sand dunes exceptionally adapted to this recreational activity; to regulate such uses in the interest of visitor safety and environmental protection; and to provide appropriate related facilities to serve the users of the area. At the same time, the area is established to afford protection to surrounding stabilized sand dunes that embrace some areas of great ecological interest and significance, including freshwater lakes. These areas are important not only in their own right, but also as key elements in the environment within which the vehicular activities will take place and in the quality of the visitor experience arising from those activities. This protection is to be afforded by exclusion of vehicular activities, by establishment of natural preserves in appropriate locations, and by other measures as required.
>
> *Declaration of Management Policy*. CDPR will manage … [Oceano] Dunes SVRA in ways that perpetuate and enhance the uses and values enumerated in the declaration of purpose, that reduce or eliminate conflicts between patterns of use arising from the kinds of resources present in the area, and that forward mutual understanding between the diverse groups of visitors and interested persons who use this area for various recreational and scientific pursuits. Operating and management procedures will provide for the protection and perpetuation of the several islands of vegetation existing within the designated vehicular use areas. All departmental activities at… [Oceano] Dunes SVRA will be carried out within the guidelines established by the Resource Management Directives of CDPR.

Public Resources Code section 5090.35 requires preparation and implementation of a Wildlife Habitat Protection Plan (WHPP) for all SVRAs. A WHPP is designed to assist resource managers in maintaining and protecting current wildlife populations and their habitats. The WHPP is a three-tiered process that includes a baseline inventory of plant and animal species, plant communities, and soil types; an annual monitoring program; and management of the park to sustain biodiversity. Special-status species populations are identified and monitored to ensure their protection, as well as to identify factors that may contribute to the overall ecological health of the habitats. In accordance with the Oceano Dunes SVRA WHPP, which is currently being updated, Natural Resource staff have mapped and designated sensitive habitats throughout the park, including riparian corridors, ponds, known locations of listed plants, and other habitat features. Natural Resource staff monitor and manage these areas to reduce recreational impacts, control invasive species, and address other resource needs.

Chapter 2. Project Description/Covered Activities

2.1 Project Description

Together, Pismo State Beach and Oceano Dunes SVRA are visited by almost two million people each year. Visitors come to enjoy wide-ranging pursuits, from OHV (i.e., vehicles that cannot be driven on public streets, such as 4x4, all-terrain vehicle [ATV] quad, motorcycle, and sandrail) recreation and camping to bird watching and horseback riding. To support this high volume and diversity of visitation, the Oceano Dunes District manages an extensive operational program that provides visitor services, including restrooms, camping areas, trails, and interpretive and educational activities; public safety, including law enforcement, first aid, and search and rescue; facilities maintenance and repair; and resource management to protect and enhance native ecosystems and cultural resources. Operations and maintenance activities may be performed by CDPR personnel, contractors, concessionaires, lessees, and/or other non-CDPR entities. All of the components of this operational program are covered activities under this HCP. In addition, certain operational activities that are HCP-required management actions may also result in take and are considered covered activities. Appendix E includes photographs of many of the features and activities described in this chapter.

2.2 Activities Covered by Permit

This section describes the covered activities for which the Oceano Dunes District HCP will provide comprehensive conservation and/or AMMs. Most of the covered activities are already currently being implemented in the HCP area with some exceptions. Those exceptions include: SNPL chick and egg capture for captive rearing if observed to be threatened by covered activities that are not associated with recovery activities (CA-12b), SNPL adult banding (CA-12b), SNPL/CLTE breeding habitat manipulation for enhancement (CA-12b), listed plant management – propagation and outplanting of listed plants (CA-15), habitat restoration program – dune slack restoration (CA-16), general facilities maintenance – mechanical trash removal (CA-21)[12], cable fence replacement (CA-28), Pismo Creek estuary seasonal (floating) bridge installation (CA-41), limited trail riding area (CA-42), replacement of the Safety and Education Center (CA-43), Oso Flaco Lake boardwalk replacement (CA-48), special projects (CA-49), reduction of the Boneyard Exclosure and 6 Exclosure (CA-50), and CDPR UAS use for park activities (CA-52). In addition, although dust control activities (CA-44) are currently implemented in the HCP area, the Dust Control Program may evolve over the HCP term in order for the District to comply with the Stipulated Order of Abatement (SOA) from the San Luis Obispo Air Pollution Control District (SLOAPCD). Covered activities are briefly summarized in the following list and then described in greater detail in sections 2.2.1 through 2.2.5.

Park Visitor Activities

- CA-1: Motorized recreation
- CA-2: Camping
- CA-3: Pedestrian activities (e.g., picnicking, sunbathing, swimming, hiking)
- CA-4: Bicycling and golfing

[12] Currently being implemented on trial basis.

- CA-5: Fishing
- CA-6: Dog walking
- CA-7: Equestrian recreation
- CA-8: Boating/surfing
- CA-9: Aerial/wind-driven activities
- CA-10: Holidays
- CA-11: Special events

Natural Resources Management[13]

- *Covered Species Management*
  - CA-12a: Installation and Maintenance of SNPL/CLTE Protection Fences
  - CA-12b: SNPL/CLTE monitoring and management, including ongoing programs (e.g., habitat enhancement, monitoring, banding, tracking, predator control, salvaging abandoned SNPL eggs and chicks); SNPL chick and egg capture for captive rearing if observed to be threatened by covered activities not related to covered species management; all other activities allowed under USFWS Recovery Permit
  - CA-13: Tidewater goby and salmonid surveys
  - CA-14: Monitoring and management for listed herpetological resources
  - CA-15: Listed plant management – monitoring, propagation, and habitat enhancement
- CA-16: Habitat restoration program
- CA-17: Invasive plant and animal control
- CA-18: WHPP implementation
- CA-19: Water quality monitoring projects

Park Maintenance

- CA-20: Campground maintenance
- CA-21: General facilities maintenance
- CA-22: Trash control
- CA-23: Wind fencing installation, maintenance, and removal
- CA-24: Sand ramp and other vehicular access maintenance
- CA-25: Street sweeping

[13] Impacts to covered species from measures taken to enhance the propagation or survival of a listed species (e.g., monitoring) will be authorized by a 10(a)(1)(A) Recovery Permit (TE-815214-10). This HCP describes the effects of these recovery activities to provide a comprehensive understanding of the conservation program.

- CA-26: Routine riparian maintenance
- CA-27: Perimeter and vegetation island fence installation, maintenance, and removal
- CA-28: Cable fence maintenance and replacement
- CA-29: Heavy equipment response
- CA-30: Minor grading
- CA-31: Boardwalk and other pedestrian access maintenance

Visitor Services

- CA-32: Ranger, lifeguard, and park aide patrols
- CA-33: Emergency response
- CA-34: Access by non-CDPR vehicles
- CA-35: ATV Safety Institute courses
- CA-36: Beach concessions
- CA-37: Pismo State Beach Golf Course operations
- CA-38: Grover Beach Lodge and Conference Center
- CA-39: Natural history and interpretation programs

Other HCP Covered Activities

- CA-40: Motorized vehicle crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco creeks
- CA-41: Pismo Creek estuary seasonal (floating) bridge
- CA-42: Limited trail riding area
- CA-43: Replacement of the Safety and Education Center
- CA-44: Dust control activities
- CA-45: Cultural resources management
- CA-46: CDPR management of agricultural lands
- CA-47: Maintenance of a bioreactor on agricultural lands
- CA-48: Oso Flaco Lake boardwalk replacement
- CA-49: Special projects
- CA-50: Reduction of the Boneyard and 6 Exclosures
- CA-51: Use of pesticides
- CA-52: CDPR UAS use for park activities

2.2.1 Park Visitor Activities

An estimated 1.5 to 1.9 million people visit the Oceano Dunes District every year engaging in pedestrian, camping, and motorized vehicle activities. All of the following visitor activities are considered covered activities in areas where they are allowed and as performed under the specific regulations that govern

the activities. Park visitor activities include, but are not limited to, the following: vehicular traffic on roads and in parking areas, motorized vehicle traffic in designated areas of Pismo State Beach and Oceano Dunes SVRA, camping, pedestrian beach uses, dog walking and horseback riding, kite flying, sail sports, hiking, surfing/boating, and occasional bicycle riding. The acreages open to these uses are shown in Table 2-1 and illustrated in Map 3.

Table 2-1. Oceano Dunes District HCP Area Land Use Acreage

Land Use	Acres
Total HCP area[1]	5,005
Open riding area[2,3]	1,138
Beach open to street-legal vehicles only	65
Open to pedestrians[4]	4,130
Open to equestrians[5]	2,317
Closed to all public visitors[6]	869
Campgrounds (Oceano and North Beach)	58
Corporation yard	6
Pismo State Beach Golf Course	25
Grand Avenue parking lots and facilities	11
Pismo Lake[7]	70
Phillips 66 leasehold	658
Agricultural lease area	211

Notes:

[1]Comprising Pismo State Beach, including the Dunes Preserve and Pismo Lake, and Oceano Dunes SVRA

[2]Includes approximately 306 acres of riding area seasonally closed March 1–September 30 for SNPL and CLTE nesting (Southern Exclosure). Note that in 2021 CDPR administratively closed this area year-round temporarily in response to now-concluded CDP permitting and litigation. This HCP anticipates the area will return to seasonal operation, consistent with actual past use, if such operation is consistent with the requirements of other programs (see Sections 2.2.1.1 and 2.2.5.5). CDPR will implement shoreline closures as needed in the 48-acre foredune area to protect nesting SNPL and CLTE and chicks.

[3]Open riding area available for camping is 1,134 acres due to year-round closure of foredune alleyways (transportation corridors) to camping.

[4]Entire HCP area except corporation yard, Phillips 66 leasehold, and agricultural lease area; additional areas may be posted as closed for resource management.

[5]Includes Pismo State Beach (except Pismo Lake, golf course, and corporation yard) and open riding area within Oceano Dunes SVRA.

[6]Phillips 66 leasehold and agricultural lease area

[7]Public access not encouraged.

Land uses and acreages overlap. Numbers are rounded.

2.2.1.1 Motorized Recreation (CA-1)

Oceano Dunes SVRA operates consistent with an existing Coastal Development Permit (CDP 4-82-300 and subsequent amendments). Amendment A5 of CDP 4-82-300, which was approved in 2001, established the following daily limits on vehicles within Oceano Dunes SVRA: up to 2,580 street-legal vehicles, 1,000 street-legal vehicles for camping,[14] and 1,720 OHVs. On summer and holiday weekends, street-legal vehicle use previously approached these daily limits. The Oceano Dunes District controls and records vehicular attendance via entrance kiosks at Grand and Pier Avenues (Table 2-2). In the summer, the kiosks are open from 8 a.m. to 11 p.m. or midnight. During the off-season, the kiosks are open from 9 a.m. to 6 p.m. (or sunset if staff is available). Hours are extended during all holidays, with the Pier Avenue kiosk staying open 24 hours. Once the Grand Avenue kiosk is closed, visitors can only enter the park via Pier Avenue. Entrance is allowed even when both kiosks are unattended.

Street-legal vehicles can operate on all designated roads within North Beach Campground, Oceano Campground, and in day use parking areas (Map 3; Pismo State Beach, monarch butterfly [*Danaus plexippus plexippus*] grove, Oso Flaco). Motorized vehicles, other than those used by park personnel, are allowed off-road only in designated areas (Map 3). Street-legal vehicles can drive onto the beach at two entrance/exit stations (i.e., the Grand Avenue and Pier Avenue sand ramps; Map 4). Street-legal vehicles can operate from Grand Avenue south throughout the riding area, which begins at Post 2 (i.e., 1 mile south on the beach from Pier Avenue). OHVs can only operate within the open riding area. OHVs must be transported to Post 2 or farther south before off-loading. The designated staging area at Post 2 is primarily used as parking for concessionaires and concessions activities (section 2.2.4.5). Camping is allowed throughout the open riding area since formal campsites are not designated (section 2.2.1.2). Motorhomes, vehicles towing trailers, and other camping vehicles thus move throughout the open riding area to access camping areas.

Motorized vehicle use is allowed in designated areas 24 hours a day. However, motorized vehicle traffic is prohibited year-round within the vegetation islands and the south/southeastern park area (Map 3) and during the SNPL and CLTE breeding season, from March 1 through September 30, within SNPL and CLTE nesting areas (Map 5). Vehicles are not allowed to park within 100 feet of the Southern Exclosure (section 2.2.2.1.1). Except for emergency responders, vehicles must obey a 15-miles-per-hour (mph) speed limit at all times while on the shoreline and in camping and developed areas; no formal speed limit is in place in the dunes when away from occupied campsites. Night driving by registered campers occurs throughout the beach and dune areas, but night driving is not allowed for day users after 10 pm, or other posted day use closing hours.

[14] Due to installation of fencing for dust control that closed off over 48 acres of prime camping area (see CA-44) and the 2021 temporary year-round closure of the 6, 7, 8, and Boneyard Exclosures in effect as of summer 2025, CDPR has administratively reduced daily camping permits to 500. Camping numbers in future years adhering to CDP 4-82-300 A5 limits could be higher, which will reflect actual levels of past use. This HCP anticipates the Southern Exclosure area will return to seasonal operation if such operation is consistent with the requirements of other programs.

Table 2-2. 2022 Oceano Dunes District Daily Visitor Use Levels – Day Use

	Day Use Vehicles[1]		Day Use OHVs[2]	All OHVs[2,3]	Day Use Persons Accompanying Vehicles[4]	Day Use Pedestrians[5]
	Daily Low–High; Avg.[6]	Total[7]	Daily Low–High; Avg.	Total	Total	Total
Permit Limit	2,580[1]	-	1,720	-	-	-
January	280-1008; 521	18,696	23-430; 201	6,228	39,262	84,391
February	280-1043; 577	18,736	20-553; 179	5,013	39,346	73,081
March	204-1014; 501	19,761	28-508; 185	5,720	41,498	60,305
April	237-1013; 599	22,025	113-655; 393	11,787	46,251	65,683
May	165-1000; 513	18,218	34-726; 320	9,917	38,258	62,991
June	321-1002; 611	21,731	171-768; 508	15,232	45,635	78,033
July	405-1003; 724	26,577	339-754; 571	17,691	55,812	89,097
August	193-1001; 524	21,970	130-749; 419	12,993	46,137	74,356
September	119-1000; 454	18,917	85-754; 318	9,543	39,726	57,326
October	134-820; 353	15,899	67-578; 287	8,893	33,387	53,808
November	102-813; 351	14,575	41-683; 303	9,100	30,607	72,061
December	126-632; 294	11,368	37-541; 219	6,794	23,871	62,702
Total	n/a	228,473	n/a	118,911	479,790	833,834

Notes:

[1]Applies only to street-legal vehicles arriving at Pier Ave. and Grand Ave. Grand Avenue entrance was closed to vehicles late July to mid-October 2022. In 2022, CDPR administratively limited street-legal day use vehicles to 1,000. Currently, with the reduction in open riding area due to dust control activities and the 2021 temporary year-round closure of the 6, 7, 8, and Boneyard Exclosures in effect as of summer 2025, CDPR has administratively reduced daily vehicle limits temporarily to 1,500 street-legal vehicles and 1,500 total OHVs for both day use and camping. Visitation in future years adhering to CDP 4-82-300 A5 limits could be higher, which will reflect actual levels of past use. This HCP anticipates the Southern Exclosure area will return to seasonal operation if such operation is consistent with the requirements of other programs.

[2]Currently, CDPR has administratively reduced OHV limits temporarily to 1,500 total combined for both day use and camping. Visitation in future years adhering to CDP 4-82-300 A5 limits could be higher, which will reflect actual levels of past use. This HCP anticipates the Southern Exclosure area will return to seasonal operation if such operation is consistent with the requirements of other programs.

[3]Includes day use OHVs + an estimate of OHVs brought in with camping visitors.

[4]Estimated number of people accompanying cars onto Pismo State Beach where street-legal vehicles are allowed. These people may then proceed to the area managed as an SVRA.

[5]Includes Pismo State Beach and Oceano Dunes SVRA pedestrians. Entering at Grand Avenue, Oceano Campground, North Beach Campground, and Dunes Preserve, Pismo State Beach pedestrians total 132,352. Entering at Pier Avenue and at Oso Flaco, Oceano Dunes SVRA pedestrians total 420,698.

[6]Paid at kiosk

[7]Includes paid at kiosk + estimate of day use vehicles entering after kiosk has closed for the day.
Source: CDPR, Oceano Dunes District (2024a)

A well-traveled route known as the sand highway runs from south of Post 4 into the backdunes all the way to the southern boundary of the open riding area (Map 3). The sand highway is marked with numbered signs for navigation. Within the dune area, OHV riders frequently gather at various locations, including near Independence Hill, Boy Scout Camp, Maidenform Flats, and Competition Hill (Map 3 and Map 6). Typically, these informal gatherings are comprised of 15 to 20 street-legal vehicles and 25 OHVs. A high of 75 to 100 vehicles has been observed informally gathered at Competition Hill.

Organized events with a focus on motorized recreation occur within the portion of the HCP area that is open to vehicles. Events may be formal competitions, organized non-competitive gatherings, or other events requiring the use of vehicles on the beach or dunes. Examples of motorized special events anticipated during the permit term are given in section 2.2.1.11.

2.2.1.2 Camping (CA-2)

Pismo State Beach has two campgrounds, both with designated campsites: North Beach Campground and Oceano Campground (Map 4). North Beach Campground has 103 campsites and Oceano Campground has 82. Together the two campgrounds received almost 237,000 camping visitors in 2022 (Table 2-3). Common day use activities at the North Beach Campground include accessing the beach and walking trails and visiting the monarch butterfly grove. Common day use activities at the Oceano Campground include walking the Lagoon (Guiton) Trail and visiting the native plant garden, Chumash garden, and visitor center, all located near the Lagoon Trail (Map 4).

Table 2-3. 2022 Oceano Dunes District Daily Visitor Use Levels – Camping

	Oceano Dunes SVRA Camping Vehicles		Oceano Dunes SVRA Camping Persons	North Beach Campground Camping Occupied Sites		North Beach Camping Persons	Oceano Campground Camping Occupied Sites		Oceano Campground Camping Persons
	Low–High; Avg.	**Total**	**Total**	**Low–High; Avg.**	**Total**	**Total**	**Low–High; Avg.**	**Total**	**Total**
Allowable Limit	1,000 (500)[1]			103 campsites[2]			82 campsites[2]		
January	21-249; 122	3,783	10,214	57-92; 74	2,294	10,323	31-66; 44	1,350	6,075
February	27-249; 140	3,918	10,579	50-93; 84	2,339	10,526	44-68; 60	1,870	8,415
March	30-250; 131	4,060	10,962	68-95; 88	2,737	12,317	48-72; 62	1,927	8,672
April	45-249; 171	5,133	13,859	73-97; 91	2,734	12,303	44-72; 65	1,953	8,789
May	19-250; 121	3,742	10,103	71-96; 88	2,735	12,308	33-72; 56	1,749	7,871
June	78-251; 219	6,573	17,747	83-97; 93	2,783	12,524	46-75; 70	2,103	9,464
July	240-251; 249	7,719	20,841	92-98; 96	2,964	13,338	66-74; 71	2,199	9,896
August	69-250; 190	5,884	15,887	87-97; 93	2,883	12,974	56-73; 67	2,081	9,365
September	57-249: 145	4,353	11,753	77-97; 92	2,762	12,429	31-73; 56	1,694	7,623
October	34-250; 139	4,296	11,599	72-95; 88	2,738	12,321	31-72; 55	1,711	7,700
November	19-249; 159	4,778	12,901	44-97; 80	2,413	10,859	29-73; 52	1,546	6,957
December	13-377; 127	3,927	10,603	26-86; 59	1,825	8,213	20-59; 40	1,236	5,562
Total	n/a	58,166	157,048	n/a	31,207	140,435	n/a	21,419	96,389

Notes:

[1]CDP 4-82-300-A5 allows 1,000 camping units. In 2022, SVRA camping was limited to 250 vehicles January 1 – December 5 and 400 vehicles starting December 6. Currently, with the reduction in open riding area due to dust control activities and the temporary year-round closure of the 6, 7, 8, and Boneyard Exclosures in effect as of summer 2025, CDPR has administratively reduced daily camping limits temporarily to 500 vehicles. Camping numbers in future years adhering to CDP 4-82-300 A5 limits could be higher, which will reflect actual levels of past use. This HCP anticipates that the Southern Exclosure area will return to seasonal operation if such operation is consistent with the requirements of other programs.

[2]Limited per campground capacity.

Source: (CDPR 2024a)

DPR anticipates a concessionaire will be in place during the permit term to rent camping trailers to individuals camping within the Oceano Dunes District, including Oceano Dunes SVRA and the two campgrounds within Pismo State Beach. In Oceano Dunes SVRA, camping is allowed throughout the open riding area (south of Post 2), including on the beach and in the dunes, and is closely associated with OHV activities. Camping usually extends east to within 100 feet of the primary dunes (typically to the restrooms; Map 3), although during the windy season, campers can be found farther back behind vegetation islands, especially near Pavilion Hill, BBQ Flats, and Eucalyptus Tree (Map 6). Camping and parking are not allowed within 100 feet of fencing signed nesting areas, including the Southern Exclosure (section 2.2.2.1.1). Camping vehicle use at the park frequently reaches daily limits during summer and holiday weekends (Table 2-3). In 2022, there were over 58,000 camping vehicles with approximately 157,000 people camping in the open riding area at Oceano Dunes SVRA (Table 2-3). Campers register at the Pier Avenue kiosk, plus Oceano Dunes SVRA staff conduct a morning camper tally to further track attendance and ensure all campers are registered. The highest camping use occurs in the summer months and in January and February during holiday periods. Vault toilets and chemical toilets are provided, and water-delivery and holding-tank pump-out services are available on the beach.

Families often establish boundaries for their camping areas, which also serve as a deterrent to other vehicles from entering the area. To do so, Oceano Dunes SVRA campers mark off campsites with yellow construction tape or other barriers, which can encircle multiple camping vehicles and extend well beyond the perimeter of each vehicle. To ensure access is maintained, Oceano Dunes SVRA staff establishes travel corridors closed to camping within the open riding area that allow vehicles to safely move between the shoreline and backdunes.

2.2.1.3 Pedestrian Activities (CA-3)

Pedestrian access is allowed 24 hours a day in most areas of Pismo State Beach and Oceano Dunes SVRA. One exception is the Oso Flaco area, which is only open during daylight hours. A sign is posted in the Oso Flaco Lake parking area, stating that the area is closed to the public after sunset. In 2022, Pismo State Beach had approximately 132,000 pedestrian day use visitors.[15] Pedestrians also enter the park via the campgrounds and Dunes Preserve. Oceano Dunes SVRA had approximately 611,000 pedestrian day use visitors, mostly entering via the Pier Avenue entrance. A small number of pedestrians visit the Oso Flaco area, usually via the parking lot and boardwalk (Map 3), but some walk in from the open riding area. A kiosk operated by staff is open at Oso Flaco from 9 a.m. to 4 or 5 p.m. Cars that park in the Oso Flaco parking lot are included with the day use vehicle totals in Table 2-3. Given the size of the lot, no more than 50 cars can park at any one time, and typical usage is well below that number, with weekends generally being the busiest. CDPR has not developed any trails or other visitor amenities at Pismo Lake. Although the Pismo Lake area is occupied at times by homeless individuals, it does not receive any quantifiable visitation for recreation purposes.

Significant pedestrian use occurs south of Grand Avenue within both Pismo State Beach and Oceano Dunes SVRA. Pedestrians have access to most beach areas and all designated trails. Pedestrians are allowed within vegetation islands year-round, unless posted as closed, but are prohibited within the closed SNPL and CLTE nesting areas (i.e., Exclosures) March 1 through September 30. The 48-acre foredune area (including the adjacent shoreline) will close to pedestrians when SNPL or CLTE nests or broods are present. Campfires and barbeques are allowed in designated campgrounds and on portions

[15] Pedestrian visitor numbers are determined by random sampling of pedestrians or by random sampling of cars at the free day use areas and observing the number of individuals arriving in those vehicles.

of the beach where vehicles are allowed (i.e., south of Grand Avenue). Fire size is limited to 3 feet in diameter by a Superintendent's Order (section 1.5.7).

Common pedestrian day use activities within the HCP area include walking along the beach, picnicking, dog-walking (section 2.2.1.6), swimming, building sand castles, exploring the Pismo State Beach monarch grove in the overwintering season (November–February), bird watching, hiking in the dunes, and occasionally playing in Pismo Creek Lagoon. The monarch grove is quite popular, with approximately 75,000 visitors recorded in the area between November 2018 and February 2019.[16] Occupants of houses along Strand Avenue comprise a small number of the day users at Pismo State Beach. Most hiking occurs at Oso Flaco, the Dunes Preserve, and on the Grand Dunes Trail, which is an informal path through the dune area south of Grand Avenue.

Pedestrian access is allowed in the Pismo Creek estuarine lagoon throughout the year, and access is allowed in Arroyo Grande Creek and its estuarine lagoon from October to February. Although the public can wade into the water at Arroyo Grande and Pismo creeks, this is an uncommon activity. Pedestrians cross Pismo Creek and Arroyo Grande Creek within the surf zone when the creek is flowing to the ocean (generally during the winter) and across the main stem during periods when the estuaries are impounded. Although no designated crossing exists, pedestrians frequently cross Arroyo Grande Creek to reach the dunes. Guiton Crossing, a private at-grade crossing in Arroyo Grande Creek, traverses Arroyo Grande Creek upstream of Oceano Dunes District property and is also used by pedestrians (Map 3).

Organized events that largely focus on non-motorized recreation occur within the HCP area (although some motorized activity occurs when vendors access the area during these non-motorized events). Such events include, but are not limited to, athletic competitions; large, organized non-competitive gatherings; and weddings. Examples of non-motorized special events anticipated during the permit term are given in section 2.2.1.11. Organized interpretive hikes and coastal cleanups normally do not require a Special Event Permit if there are fewer than 25 people. Junior Rangers and other programs organized and hosted by the Oceano Dunes District do not require Special Event Permits.

2.2.1.4 Bicycling and Golfing (CA-4)

Bicycling occurs primarily in designated campgrounds and on the beach occasionally when the tide is low. Bicycles are not allowed at Oso Flaco Lake or on boardwalks. E-bikes and traditional bikes are allowed anywhere motorized vehicles are allowed and are also permitted on Pismo State Beach north of Grand Avenue. Golfing occurs at the Pismo State Beach Golf Course as described in section 2.2.4.6.

2.2.1.5 Fishing (CA-5)

Shore fishing is allowed and is a common activity on beaches where pedestrians are allowed. Fishing is prohibited within the Exclosures from March 1 through September 30 (i.e., within the CLTE and SNPL breeding season). Fishing will also be prohibited in the 48-acre foredune area (including the adjacent shoreline) when SNPL or CLTE nests or broods are present. Fishing is also legal year-round in Oso Flaco Lake; however, the Oceano Dunes District has posted fish consumption advisories because of high levels of pesticides found in fish tissue from the lake. Shore fishing activities typically occur between Pier Avenue and Post 6 and in the Oso Flaco area where the beach is accessed via the boardwalk. Between 5 to 15 individuals can be observed fishing at any one time in the Oceano Dunes District, with increased

[16] Monarch grove visitor numbers are captured by docents using clicker counters to count the number of visitors between 10 a.m. and 4 p.m., weather permitting.

activity on weekdays. Since 2020, there has been a resurgence of Pismo Clam on all areas of the shoreline. Starting in 2023, there were reliable reports of legal sized clams being harvested within the HCP area. Fishing for Pismo clams occurs during lower tides, with generally no more than 20 individuals clamming along the shoreline in any given day.

2.2.1.6 Dog Walking (CA-6)

Dogs are allowed on a leash of no longer than 6 feet and under the control of their owner in most locations at Pismo State Beach and Oceano Dunes SVRA. Dogs, other than service dogs, are restricted from the Dunes Preserve and in the south/southeastern portion of Oceano Dunes SVRA, including around Oso Flaco Lake (Map 6). Service dogs are required to accompany their owners and are therefore permitted to enter any area open to visitors where other dogs are restricted. All dogs are prohibited from entry into any area closed to visitors, such as the seasonal SNPL and CLTE Exclosures and the Phillips 66 leasehold. All park maps detail leash requirements and all entrance stations have “dogs on leash” signs. Every park employee is aware of and instructed to educate visitors on the leash rule. All park staff that observe a violation of the leash rule may establish contact with the offending party and issue a verbal warning. Rangers may also issue citations.

2.2.1.7 Equestrian Recreation (CA-7)

Equestrians are allowed on and commonly use most of the beaches and trails at Pismo State Beach, including the Dunes Preserve, and at Oceano Dunes SVRA. Equestrians must remain on designated trails where such trails exist. Equestrians are not allowed south of the riding boundary fence (section 2.2.3.9), including around Oso Flaco Lake (Map 6). Most equestrians park in the lot at Grand Avenue and then proceed down the Grand Dunes Trail and exit to the beach at Midramps (Map 4). Other equestrians, particularly those renting horses, travel down the Arroyo Grande Creek Flood Control Channel levee and through the Dunes Preserve, exiting to the beach at Arroyo Grande Creek and traveling up or down the beach from there. Equestrians frequently cross Arroyo Grande Creek at Guiton Crossing, upstream of CDPR property, to reach the dunes. Typically, equestrian use is high when OHV use is low (e.g., during the rainy season). On average, there are 2 to 15 horses every day with most equestrian use occurring on weekends. Equestrian traffic is prohibited from entry into any area closed to visitors, such as the seasonal SNPL and CLTE Exclosures.

2.2.1.8 Boating/Surfing (CA-8)

Small craft boating is allowed at both Pismo State Beach and Oceano Dunes SVRA. At Oceano Dunes SVRA, small non-motorized boats are allowed and occasionally seen on Oso Flaco Lake. However, boating can be restricted at the lake if it conflicts with resource protection. Boating is also allowed in Oceano Lagoon. Boats can be launched into the ocean at Pismo State Beach and Oceano Dunes SVRA south of Grand Avenue, but they cannot land on the Exclosures shoreline (Map 6) during the SNPL and CLTE breeding season or the 48-acre foredune shoreline when SNPL or CLTE nests or broods are present.

It is legal to launch motorized boats in the HCP area. People typically use trailers to transport their watercraft to the beach. However, from March 1 through September 30, watercraft traveling south of Post 6 must remain in the water and are not allowed onto soft sand along the shoreline to prevent disturbing breeding SNPL and CLTE.

Surfing and stand-up paddleboarding most frequently occur near the Pismo Beach Pier and south of Pier Avenue, although surfers also occur elsewhere, such as near Post 6 (Map 6). Surfers and paddleboarders typically park at Pier Avenue and walk in or park on the beach.

2.2.1.9 Aerial/Wind-Driven Activities (CA-9)

While not a common activity, kite flying is permitted at all of the state beaches, except where restricted by Superintendent's Order (section 1.5.7). Within the HCP area, kite flying is prohibited during the SNPL and CLTE breeding season from Pier Avenue south to the southern Oceano Dunes SVRA boundary.

Kiteboarding has become a popular activity along the coast. Kiteboarding, including kitesurfing, and windsurfing are allowed at most state beaches. Windsurfers and kiteboarders typically set up on the wet to semi-wet beach and surf to just outside the surf zone. Unlike windsurfers, the "sail" on a kiteboard is an aerial kite that could create the same disturbance threat as kite flying. Within the HCP area, dry land launching and landing of kite boards is always permitted between Pismo Creek and the Pier Avenue sand ramp. Wet launching and landing of kite boards (i.e., launching and landing where the entire kite equipment is in/above the rolling water) is permitted south of Pier Avenue. Open water kite boarding is allowed from Pismo Creek to Post 6. Launching and landing on dry land is only permitted between Pismo Creek and Pier Avene and open water kite surfing is prohibited south of Post 6 year-round (Map 6). Kiteboarding regulations are in place under a Superintendent's Order (section 1.5.7), which is updated as conditions change and based on operational needs. Kiteboarders typically launch between Grand and Pier Avenues, with some sailing south of Pier Avenue as far as Post 4. Typically, 2 to 15 kiteboarders may be present at a time whenever it is windy, with the windy season lasting from the middle of March to the middle of July. Windsurfers are not common in the HCP area, preferring the conditions at Hearst San Simeon State Park.

Park visitors may use unmanned aircraft systems (UAS; aka drones) consistent with Superintendent's Order No. 554-022-2024. The order prohibits UAS use during the SNPL and CLTE breeding season (March 1 – September 30) south of Pier Avenue in Pismo State Beach and in all areas of Oceano Dunes SVRA, including the Oso Flaco Lake area. UAS operators are required to know, understand, and comply with all applicable rules, regulations, and laws directing and controlling UAS. CDPR may direct UAS operators to terminate operations at any time, including for natural resource concerns. The general public is prohibited from using UAS within Pismo Dunes Natural Preserve at all times.

Model rocket launching is an aerial activity that could greatly disturb nesting birds. This activity is not allowed in the HCP area at any time. Fireworks are addressed in section 2.2.1.10.

2.2.1.10 Holidays (CA-10)

The Oceano Dunes District often sees a significant increase in visitation during 3-day holiday weekends, but camping and vehicle levels remain the same due to daily camping and vehicle limits per the CDP (section III.3.d. of CDP 4-82-300-A5) that remain in place at Oceano Dunes SVRA. July 4 is typically one of the busiest holidays of the year. Numerous coastal municipalities sponsor commercial fireworks shows attracting a large influx of visitors to the state, county, and city beaches. The City of Pismo Beach commercial fireworks show that takes place on the Pismo Beach pier attracts a large crowd of spectators on the beaches, including Pismo State Beach and Oceano Dunes SVRA. However, other than the City commercial fireworks display, fireworks are prohibited in CDPR units. As a result, fireworks are only legal at the most northern portion of the HCP area, which is over 2 miles away from most nesting SNPL and CLTE. Despite this restriction, illegal fireworks are often observed throughout Oceano Dunes SVRA, including near the Exclosures. Additional rangers and resource staff are employed during July 4 to handle the large crowds and vehicular traffic. The ranger staff specifically focuses enforcement and education staff near the Southern Exclosure during the July 4 holiday weekend. CDPR continues to implement educational efforts and heightened enforcement to reduce the use of illegal fireworks in that area.

2.2.1.11 Special Events (CA-11)

Each year, Pismo State Beach and Oceano Dunes SVRA host numerous organized events including beach clean-ups, weddings, family reunions, corporate dinners, bonfires, surfing and other sporting contests, media events, video commercials, commercial still photography sessions, and off-road events. Organized special events hosted by outside agencies, businesses, and organizations may require a CDPR Special Event Permit, which must be approved by the District Superintendent. Special Event Permits describe the activity or event that is to occur, the estimated number of participants, the entry fee schedule, the items to be sold, the insurance requirements, and any special conditions placed on the activity or event by the District Superintendent. The permit conditions include AMMs required to protect resources during the event. Specific AMM recommendations are based on past experience and are dependent on the event's location, timing, and its potential to impact covered species. Permit conditions also ensure that events are planned to avoid sensitive resources, including by adjusting the timing and location of the event. For larger events, the Oceano Dunes District resource staff surveys the special event area prior to the event to verify that no CLTE or SNPL are present. An internal protocol for smaller Special Event Permits (e.g., weddings, bonfires, family reunions, corporate dinners near Grand Avenue) requires the resource staff to survey and report any conflicts prior to the event. The Oceano Dunes District also ensures that none of these events result in vehicle limits established by the CDP (section III.3.a. and d. of CDP 4-82-300-A5) being exceeded.

While the specific events that occur during the ITP term will vary, the following examples illustrate the nature of permitted special events potentially occurring in the HCP area. All of these events could occur in any month of the year. These and other similar events are expected to continue during the permit term. The Oceano Dunes District does not issue Special Event Permits for events on the portion of Pismo State Beach operated by the City of Pismo Beach.

- *Poker Runs.* Poker runs are non-timed, non-race, self-guided activities during which participants drive to checkpoints along a course within the open riding area. Such events may include a vending/registration/staging area, typically less than an acre in area, which is also located within the open riding area. These events are typically single-day events.
- *Hucking.* Competitive truck jumping or "hucking" involves an exhibition of trucks jumping off a gradual incline sand dune ramp with a flat landing area. Hucking events have been held at the Competition Hill portion of the open riding area. Other motorized exhibitions may also be included in hucking events. Such exhibitions are expected to include space for vendors, camping, a stage, and other temporary event facilities closer to the beach. To date, these exhibition areas have been less than 10 acres. From initial set-up to final cleanup, the overall event lasts less than a week; however, the exhibition itself lasts no more than 2 days.
- *Vintage Car Races.* Such events may include car displays, races of pre-World War II-era motorcycles and cars on the hard sand, a beach party, bonfire, and vendors. The race itself comprises two vehicles racing on a short (<1,000 feet) stretch of beach. Cars and motorcycles cross the finish line with an average maximum speed of 35 mph. These events typically take place on weekends.
- *Concerts*. Events may include amplified music, vendors, and camping. Music and other activities may occur around the clock. These events typically take place on weekends.
- *Group Campfires and Receptions.* Group campfires and receptions are frequently set up on the beach near the Grand Avenue entrance.

- *Sports.* Running and/or walking race courses may traverse the beach and dunes. Other non-motorized sporting events include soccer, baseball, and kiteboarding tournaments and exhibitions. These events may include food vendors, music, and other entertainment. These events usually take place in Pismo State Beach and are generally single-day or weekend events.
- *Rodeo Events.* Starting in 2022, the California Polytechnic San Luis Obispo (CalPoly) Rodeo Program has hosted an annual demonstration event on the beach north of Grand Avenue. This single-day event involves setting up temporary fencing, corrals, seating, and audio-visual equipment on the beach and bringing livestock and horses onto the beach. Some event material can be stored on the beach the day before the event, but all livestock, fencing, and materials are removed immediately following the event. Natural Resource monitors are actively involved in the set up and operation of this event, helping the organizers to protect sensitive resources in the area, including shorebirds, stranded marine mammals, and Pismo clams.
- *Weddings.* Approximately 25 weddings are held at Pismo State Beach each year. Most weddings occur either in the foredunes and cypress (*Cupressus* sp.) grove near the golf course or near the Grand Avenue entrance within the non-motorized portion of the park. Weddings planned with bonfires or other fire sources are set up within the motorized portion of the park. Weddings usually start at 2 p.m. or later and are allowed to be set up hours before with someone on scene for the duration of the set-up. Wedding ceremonies typically last about an hour; however, if the event includes a reception, then it may last for 5 to 6 hours. Wedding items must be broken down immediately following the conclusion of event activities.
- *Video Production and Still Photography.* Video production and still photography "shoots" require permits and may occur anywhere in the HCP area, with approximately 35 to 40 shoots occurring every year. The shoots may involve minor impacts, such as people standing in the Dunes Preserve shooting still photos, to shoots with greater impacts, such as motor vehicles moving along the shoreline or backdunes. Filmed activities are almost always only those activities already allowed in the area used for the production (i.e., the permits do not generally authorize activities that will otherwise be prohibited).
    - UAS filming will be allowed on a case-by-case basis in the HCP area during the permit term. All UAS operations will be consistent with CDPR policies regarding UAS use. Operators must have received a permit to operate over CDPR lands and must comply with 14 CFR Part 107, which establishes the minimum safety standards for small UAS operations in the United States. As part of the permit to operate, any non-CDPR person conducting UAS filming will be required to follow AMMs to reduce impacts to covered species. For example, during the breeding season, non-CDPR UAS will not be allowed along the shoreline or on the beach south of Post 4.5. In addition, a USFWS-approved monitor will accompany non-CDPR UAS operators at any time of year if it is determined there is potential to impact covered species.

2.2.2 Natural Resources Management Program

Regular, ongoing natural resource management activities in the HCP area include covered species management, management of vegetation islands, vegetation planting and habitat restoration, biological resource monitoring, invasive plant and animal control, prescribed fire management, and installation of fences and signs to prevent trespass in sensitive areas. These activities are described in more detail in the following sections.

2.2.2.1 Covered Species Management

A detailed discussion of the management areas and management AMMs is provided in Chapter 5. Information provided in the following sections offers an overview of the covered species management program. The management program described in this HCP will be consistent with the current management of SNPL and CLTE in the HCP area. Management of SNPL and CLTE in the HCP area is currently conducted under a USFWS 10(a)(1)(A) permit and/or CDFW Memorandum of Understanding (MOU) that authorize activities, including, but not limited to, monitoring nests and banding chicks Appendix B).

Many of the activities listed under Covered Species Management can be associated with incidental take and are covered under this HCP. However, impacts to covered species from activities conducted under a FESA section 10(a)(1)(A) Recovery Permit (e.g., ES815214-10 and TE101154-3, and respective renewals; see Appendix C and Appendix D) will not be authorized through the ITP but instead through the Recovery Permit. This HCP describes all covered species management activities regardless of permitting vehicle because those activities are critical to the overall conservation program outlined in the HCP.

2.2.2.1.1 Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (CA-12a)

Each year, from approximately March 1 through September 30 during the SNPL and CLTE breeding season, CDPR encloses approximately 300 acres of Oceano Dunes SVRA open riding area plus approximately 68 acres in North Oso Flaco Exclosure within a 6-foot-tall seasonal exclosure (i.e., non-climb fence) to prevent terrestrial predators, vehicles, and humans from entering protected nesting and chick-rearing habitat. [17] The public is prohibited from entering this seasonal exclosure area and the adjacent shoreline during the nesting season, and neither camping nor parking is allowed within 100 feet of the fenced area. The seasonal exclosure and the adjacent shoreline fencing remained in place 2021 to 2024 and was closed year-round during this period. For this HCP, the area will be closed only during the nesting season, if seasonal operation is consistent with the requirements of other programs (see, e.g., section 2.2.5.5). Based on these other operational or regulatory considerations, all or a portion of this area may be closed temporarily or permanently during the non-breeding season. The seasonal exclosure is made of a lower layer of 2-inch by 4-inch non-climb fence and an upper layer of mesh. The fence is buried in the sand up to 8 inches deep to discourage coyotes (*Canis latrans*) and other potential mammalian predators from digging into the nesting area and depredating a nest. The 6-foot height of the exclosure is intended to deter coyotes from climbing over the fencing. The fence is installed using peeler poles, which are located roughly every 100 to 120 feet with about five metal T-posts between them. Beginning in 2023, CDPR tested placing tall, large metal posts between the peeler poles for additional support on a small portion of the east side of the exclosure and used the taller posts for the entire east fence in 2024. Jute netting is also placed at the base of the east fence at the beginning of the breeding season and covered with sand, which prevents gaps from developing. Bird barrier spikes (e.g., Nixalite) are installed on peeler poles to discourage avian predators from roosting near the Exclosures.

The exclosure in the open riding area is referred to as the Southern Exclosure and comprises four subareas (Map 5), including the 6 Exclosure (approximately 62 acres), 7 Exclosure (approximately 63

[17] This section describes the predator fencing specifications currently being used in the HCP area; however, the specifications of the predator fencing used in the HCP area could change based on new information or new protocols issued by USFWS and/or CDFW.

acres), 8 Exclosure (approximately 82 acres), and the Boneyard Exclosure (approximately 92 acres). Due to the rapidly shifting open sand dunes in the eastern Boneyard Exclosure area and in order to exclude coyotes from entering the northern Southern Exclosure area, a 6-foot-tall interior non-climb fence consisting of 2-inch by 4-inch mesh bisects the Boneyard Exclosure from north to south during the breeding season. As a result, the Boneyard Exclosure is divided into two separate areas, including the approximately 44-acre West Boneyard Exclosure (contiguous with 6, 7, and 8 Exclosures) and the approximately 44- to 49-acre (depending on dune topography) East Boneyard Exclosure. See section 2.2.5.11 (CA-50) regarding proposed changes to the Boneyard and 6 Exclosures.

An additional exclosure is present in the HCP area and is referred to as North Oso Flaco Exclosure. This exclosure is contiguous with the Southern Exclosure and extends south from the 8 Exclosure to the pedestrian boardwalk access trail to the Oso Flaco Creek shoreline (approximately 0.5 mile of shoreline and approximately 68 acres). The North Oso Flaco Exclosure fencing is the same design as the Southern Exclosure and is designed to keep potential mammalian predators out and exclude the public. Signs are attached to posts along all exclosure fencelines to educate visitors about the closed area for SNPL and CLTE. The North Oso Flaco Exclosure is permanently closed to OHV recreation, but the area is open to pedestrian activity during the non-breeding season.[18] North Oso Flaco Exclosure is managed consistently with the areas of the Southern Exclosure during the breeding season. The combined area of the Southern Exclosure and North Oso Flaco Exclosure is referred to as Exclosures, and the contiguous area with 2-inch by 4-inch predator fencing within the Exclosures is referred to as the seasonal exclosure.

A nest located within a fenced area (e.g., Southern Exclosure, 48-acre foredune, vegetation island) but close to the boundary of the open riding area requires temporary additional fencing extending into the open riding area to allow an adequate buffer between recreational activities and the nest. This type of extended fence is called a “bumpout.” CLTE nests within 330 feet (100 meters), or other distance based on best available site-specific information and in consultation with Wildlife Agencies, of the open riding area and SNPL nests within 100 feet (30 meters) of the open riding area receive a bumpout. CDPR staff extend the bumpouts when recreational activities continue to cause disturbance to nesting birds. Although the public is excluded from these bumpouts, monitoring staff may enter the larger CLTE bumpouts when needed to successfully conduct monitoring. Bumpouts are removed once nests in the buffer area are no longer active or after chicks have fledged and/or moved out of the area.

South Oso Flaco and Arroyo Grande Creek are also protected from public disturbance during the breeding season; however, instead of fencing used for the seasonal exclosure, symbolic fencing is used to keep the public out of nesting habitat. The portion of the Exclosures shoreline, outside the fenced seasonal exclosure, is protected from the public using symbolic fencing at the boundary points. The 48-acre foredune area is also closed to the public when nests are present; the shoreline is closed using symbolic fencing, and western alleyways are closed using wire fencing (non-predator field fencing). Symbolic fencing consists of rope strung between metal T-posts with signs that are installed at regular intervals. Symbolic fencing does not exclude predators. Nests within the symbolic fencing areas may receive some type of individual nest exclosure, as described below.

CDPR staff also selectively installs smaller wire exclosures, including the following:

- *Large single-nest exclosure*: CDPR staff install large circular single-nest exclosures around any CLTE or SNPL nest found in the open riding area. The minimum nest exclosure radius is 330 feet

[18] CDPR administratively closed the North Oso Flaco shoreline in 2021 temporarily in response to now-concluded permitting and litigation. This HCP anticipates the area will return to seasonal operation.

for CLTE nests, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, and 100 feet for SNPL nests. Single-nest exclosures of differing sizes may also be used to protect SNPL nests in areas where vehicles are not permitted (e.g., Exclosures shoreline, South Oso Flaco, Arroyo Grande Creek, and areas north of Grand Avenue). Large single-nest exclosures are open at the top. Depending on the nest location and predator concerns, the exclosures are built with fencing made of 2-inch by 4-inch wire mesh, 5-foot-high sides, and the bottom 8 inches are buried or with a slightly larger mesh wire fence a height of approximately 4 to 5 feet unburied (non-predator field fencing). Camping and parking are not allowed within 100 feet of a single-nest exclosure when in the open riding area. Large single-nest exclosures are removed after nests are no longer active or after chicks have fledged and/or moved out of the area.

- *Small single-nest exclosure*: CDPR staff selectively uses a small circular or one of two small square nest exclosures (made of 2-inch by 4-inch wire) around SNPL nests inside or outside of seasonal exclosure fencing for protection from predators, including roosting gull (*Larus* sp.) flocks. CDPR staff use different exclosures based on a variety of factors, including, but not limited to, weather, topography, predator threats, and proximity to young broods. A 7-foot-diameter circular exclosure has been used since 2012 to protect SNPL nests outside the seasonal protected area, and a 10-foot by 10-foot exclosure was used previous to 2012. These exclosures are built with 5-foot-high sides and the bottom 8 inches are buried. Plastic netting made with 0.5-inch by 0.5-inch mesh is added to the top of these exclosures when avian predation is a concern.
- *Mini exclosure*: Mini exclosures have been used since 2010 to protect SNPL nests. These exclosures are 3-feet by 3-feet by 3-feet with a wire-mesh top and staked into the ground. When used outside the seasonal exclosure, the bottom of the exclosure is buried in the ground between 4 and 8 inches.

Installation, maintenance, and removal of the seasonal exclosure involves substantial labor and requires equipment, including vehicles for CDPR staff and materials transport. Installation and removal of the seasonal exclosure takes 4 to 6 weeks. Installation, maintenance, and removal of the smaller exclosures and bumpouts requires less equipment (e.g., vehicles for CDPR staff and materials) and takes less time (the installation can usually be accomplished within 2 hours). Because seasonal exclosure fencing is prone to being buried or undermined, depending on wind conditions, it requires constant maintenance to remain an effective predator barrier. During the windy season, maintenance occurs several times a week. Routine maintenance includes burying or exposing buried sections, replacing fencing, adjusting fencing and fence posts, and maintaining signs. At times, maintenance requires heavy equipment—at least once per week during windy periods—to remove accumulated sand or bury large sections that have become exposed.

Many of the activities listed in this section are recovery activities that are specifically authorized in the USFWS 10(a)(1)(A) Recovery Permit (TE-815214-10). Some of the activities in this section would be HCP activities because they could result in incidental take to covered species and are not specifically authorized under the Recovery Permit (see Appendix D). Installation and hand maintenance of the seasonal exclosure, symbolic, and smaller wire exclosure fences are covered under the USFWS Recovery Permit because these fences are designed to protect nests and nesting areas from public activities and predators. Chapter 4 identifies the specific activities that could result in incidental take and are covered by this HCP.

2.2.2.1.2 Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Prior to each breeding season, the Oceano Dunes District has been preparing a SNPL and CLTE management plan entitled *Nesting Season Management Plan to Avoid Take of the California Least Tern and Western Snowy Plover at Oceano Dunes SVRA*[19] (Nesting Season Management Plan; Appendix F). The management plan has detailed measures to be taken during the SNPL and CLTE breeding season to manage and monitor breeding CLTE and SNPL, including installation and maintenance of the seasonal exclosure described in section 2.2.2.1.1. After the conclusion of each breeding season, the District has been preparing an annual nesting report entitled *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes SVRA*[20] (Appendix G). The annual nesting report has described the management and monitoring measures that were implemented during the breeding season, has given detailed breeding results, and has provided recommendations for future management and monitoring. The management and monitoring measures described in the annual nesting reports are the foundation for the AMMs in this HCP and are incorporated into the conservation program to avoid and minimize take (Chapter 5).

Many of the activities listed in this section are recovery activities that are specifically authorized in the USFWS 10(a)(1)(A) Recovery Permit (TE-815214-10). Some of the activities in this section would be HCP activities because they could result in incidental take to covered species and are not specifically authorized under the Recovery Permit (see Appendix D). Chapter 4 identifies the specific activities that could result in incidental take and are covered by this HCP. In addition to the seasonal exclosure and other protective fencing described previously, the program includes the following activities, which are detailed below and in Chapter 5:

- Daily monitoring of nesting CLTE and SNPL during the breeding season (March 1 through September 30)
    - Surveying transects within the open riding area
    - Surveys of Exclosures, South Oso Flaco, 48-acre foredune area, and vegetation islands with available nesting habitat
    - Protecting chicks/nests observed in the open riding area by closing areas where chicks are located. The chicks are carefully monitored until they move back into protected areas (i.e., 48-acre foredune area, Exclosures)
    - Floating eggs to estimate hatch date
    - Deploying cameras to detect predation events and potential predators and to confirm adult attendance
    - Banding and monitoring chicks to determine fate
    - Salvaging abandoned eggs/chicks and bringing them to an appropriate rehabilitation/captive-rearing facility (SNPL only)
- Monitoring of CLTE night roost and freshwater lake use
- Monitoring and control of potential predators, as appropriate

[19] The Nesting Season Management Plan will be superseded by this HCP in the future and will, therefore, no longer be required.
[20] In the future, the Annual Nesting Report may be folded into the annual report described in section 6.4.1.

- Monitoring of SNPL during the non-breeding season (October 1 through February 29)
- Conducting necropsy on CLTE and SNPL carcasses per direction of the Wildlife Agencies
- Enhancing nesting/chick-rearing habitat, as needed, including addition of wrack (i.e., seaweed and other organic materials that wash ashore on the beach), woodchips, driftwood, and plants
- Reducing vegetation density and lowering dune height, where deemed necessary to improve nesting habitat
- Conducting visitor education and enforcing regulations

Daily Monitoring

Daily monitoring of nesting SNPL and CLTE occurs from March 1 through September 30. At a minimum, four to eight Natural Resource monitors are present during the morning and early afternoon hours. As the season progresses, monitoring increases to include the late afternoon and evening hours. Monitoring involves walking to assess or find new nests, as well as scanning for nests and chicks from parked vehicles outside closed areas such as the Southern Exclosure, the 48-acre foredune area, and from vehicles within the Exclosures on the shoreline. Monitors check most CLTE and SNPL nests daily. Monitoring always occurs in a manner that minimizes disturbance or adverse effects on adult birds, nests, and chicks.

Monitoring of the open riding area also occurs daily. Monitoring of the open riding area involves driving a vehicle along defined transects to look for SNPL and CLTE nests and/or chicks. Areas along the transects with signs of SNPL and/or CLTE nest activity (e.g., scraping or copulating birds) are checked more thoroughly on foot and with increased frequency using binoculars and/or a spotting scope. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a single-nest exclosure to provide a 100-foot minimum buffer for SNPL and a 330-foot buffer for CLTE, or other distance based on best available site specific information and as appropriate (section 5.3). In addition, nests found within fenced areas but close to the open riding area, buffer fencing (bumpout) will be installed to provide the minimum buffer from the nest to the open riding area. The bumpout will be enlarged, as necessary, until monitors observe that SNPL adults are no longer disturbed.

When monitors find chicks in the open riding area, the area is closed to vehicles and monitors are present to control traffic and ensure they are kept from disturbing the chicks. Additional monitors are posted in vehicles at various distances from the chicks to track their movement. Chicks are directed back into the protected area (e.g. Southern Exclosure or 48-acre foredune) by monitors who slowly and carefully walk toward the chicks and encourage movement in the direction of a protected area. SNPL adults and chicks are allowed time to brood and forage as they travel to the protected area while staff monitor from a distance or from inside a parked vehicle. The vehicle acts as a blind and allows the brood to behave normally without disturbance. If necessary, additional monitors are also present to watch for potential avian predators, such as gulls, and flush them from the area. Monitors continue to watch chicks once directed back into the closed area to confirm they remain in the protected area. Similarly, if an attending adult SNPL is ready to move chicks from an upland nest site to an area closer to the shoreline, monitors will ensure safe passage of chicks.

If SNPL chick(s) are separated from the brood and remain in the riding area and are at risk of being struck by a vehicle despite CDPR's best efforts to direct them back to the closed area, CDPR may capture the abandoned chicks and attempt to reunite them with sibling chick(s) and attending adult(s) within the protected area. If reuniting chicks is not feasible (e.g., close proximity of broods on shoreline would cause too much disturbance, weather conditions unfavorable, remaining brood not located) or efforts to

reunite the SNPL chicks with associated adults fail, CDPR staff may collect abandoned chicks and transfer them to an approved wildlife facility, as described in the subsection entitled Salvage and Rescue below.

Floating Eggs

Many SNPL and CLTE clutch initiation dates can be estimated from egg-laying dates since this date is often known. However, when SNPL and CLTE nests are found at full clutch and egg-laying dates are not known, eggs will be floated to better estimate initiation and expected hatch dates. Nests will not be disturbed for egg floating during climatic conditions such as high wind and extreme cold or heat or if approaching the nest will disturb nearby broods. Only those individuals approved by USFWS will float SNPL eggs and only those individuals approved by USFWS and CDFW will float CLTE eggs.

Banding

CDPR bands a large portion of CLTE and SNPL chicks in the HCP area to provide the most accurate data on fledgling success. Banding is also necessary to determine factors promoting or threatening survival of chicks, as well as the seasonal productivity for assessing management effectiveness. The District attempts to band as many chicks as possible, but there are situations when CDPR staff will determine the banding effort is not suitable or could be detrimental to the birds, such as when banding would cause too much disturbance to other broods/chicks in close proximity. A variety of other factors will prohibit banding including, but not limited to, very young unbanded chicks lost prior to any banding opportunity, climatic conditions such as high wind and extreme cold or heat that would make banding unsafe, topography and vegetation in area of chicks making them difficult to locate, and chicks from nests with unknown locations found when too old and mobile to capture for banding. An average of 57% of SNPL chicks and 74% of CLTE chicks were banded for the years 2019 to 2023. The percent of chicks banded varies and is often lower when predation of chicks during any portion of the season is exceptionally high.

All banding in the HCP area is conducted by appointed staff that have obtained the appropriate state and federal permits. CLTE and SNPL chicks in the HCP area are typically banded from 0 to 3 days from the day they hatch. Banding methods are conducted to avoid compromising the safety of chicks. Chicks are pursued for only a short period of time, typically less than 2 minutes for a single capture attempt and less than 20 minutes in a single day during multiple attempts to capture an individual chick. Chicks are captured by hand, and, when possible, at or close to the nest location. Chicks are released together after banding of all chicks is completed.

CLTE chicks receive a single size 1A blank aluminum band on one leg and a size 1A numbered aluminum federal band on the other leg with color tape covering both bands. The color combinations are applied in such a way to give each individual a unique band combination for the year. SNPL chicks within a brood are given the same color band combination. CLTE chicks are also weighed immediately prior to banding. Band materials and methods used may change over time depending on the accepted CDFW/USFWS protocols and as determined by the appointed permitted staff.

Unbanded adult CLTE and SNPL are not currently banded in the HCP area. The occurrence of abandoned SNPL nests can raise concern about possible mortality of adult SNPL. As a result, if elevated adult mortality is observed, banding of SNPL adults could provide beneficial information, such as allowing

monitors to verify that mortality was in fact occurring. CDPR may band adult SNPL if it is determined to be necessary.[21] At this time, banding of CLTE adults is not expected to occur as part of this HCP.

Salvage and Rescue

In some circumstances related to covered species management (e.g., abandoned SNPL eggs and/or chicks that are separated from attending adults, chicks deemed to be vulnerable because of unusual circumstances such as an attending adult being predated, etc.), SNPL eggs and/or chicks are collected and will continue to be collected and transferred to an approved facility, such as the Santa Barbara Zoo or Monterey Bay Aquarium (AMM 90). Injured juveniles and adult SNPL are also sometimes brought to an approved facility, such as Pacific Wildlife Care, to be rehabilitated and released back into the wild. This activity is ongoing in the HCP area and is associated with CDPR's covered species natural resources management program.

In the future, under this approved HCP, if SNPL chicks or eggs are determined to be vulnerable to a covered activity that is not related to covered species management activities despite CDPR's efforts[22] to protect eggs and/or direct chicks back to protection of a closed area and reunite them with attending adults, CDPR staff may collect SNPL eggs and/or capture chicks and transfer them to an approved wildlife facility. This activity is new and is included as AMM 22 (see Table 5-2).

All chicks in captivity are raised in a manner where they will not imprint on humans. If sufficient bands are available, banders are available, and other logistics are satisfied, all fledglings are color-banded to individual prior to releasing them back into the wild to assist in tracking bird movements, survival, and future reproductive success. In all cases, the need for captive care is determined by a qualified biologist/Natural Resource staff, is used selectively, and is dependent on an approved facility having the capacity to accept the eggs and/or chicks. If time permits, CDPR staff will continue to confer with USFWS prior to collecting eggs or chicks for captive rearing. CLTE eggs and/or chicks are not currently collected in the HCP area and captive rearing of CLTE is not currently available.[23]

Monitoring CLTE Night Roost and Freshwater Lake Use

During the breeding season, CLTE may assemble in a night roost. Monitors search for evidence (tracks, roosting scrapes, fecal matter) of the roost in the open riding area during daily morning transects and periodically within the Southern Exclosure to identify night roost locations. Monitors search for the night roost location at least once per week, weather permitting, and record total numbers of individuals present as CLTE arrive at dusk. Night-vision equipment is available and used for this task, but it has limited range for viewing from a distance. As a result, there are occasions when CLTE are heard vocalizing and not seen because they arrive after it is too dark to be seen. Therefore, the counts provided are minimum counts due to the limited visibility of night roosts.

CLTE may frequent bodies of freshwater as sources of prey fish in addition to the near-shore ocean. Staff observe if CLTE are flying in the direction of nearby freshwater lakes or ponds and may survey the

[21] Any banding of adult SNPL will be subject to approvals by appropriate regulatory agencies.
[22] At times, based on Senior Environmental Scientist professional discretion, CDPR may determine that SNPL eggs and/or chicks should be collected and transferred to an approved wildlife facility without an attempt to protect them on-site because protecting eggs and/or directing chicks back to the exclosure will not eliminate the threat of the covered activity. As a result, captive rearing would be the only option to prevent mortality or injury to the eggs or chicks.
[23] Releasing CLTE from captivity is not usually an option since they migrate together as a family or in groups.

freshwater sources for CLTE use, if feasible and depending on property access. During the surveys, the monitors determine if the lakes provide additional appropriately sized fish to feed chicks.

Predator Management Program

Predators and predation can be important factors that limit SNPL and CLTE nest success by directly depredating eggs, chicks, juveniles, or adults or indirectly by increasing time spent by adults in vigilance or avoidance behavior and reducing incubating and/or chick-rearing behavior. Substantial evidence exists indicating that human activities affect the type, number, and activity patterns of predators, thereby altering natural predation patterns. As a result, the Oceano Dunes District implements a predator management program to protect nesting SNPL and CLTE.

Predators are monitored from March through mid-September by CDPR and contractors to collect information on predator presence in and around the HCP area. During the breeding season, monitors directly observe mammalian and avian predators and their sign (e.g., tracks, scat, regurgitated pellets, prey remains, depredated nests) each day on foot and from vehicles and then record species, type of sign, behavior (if observed), characteristics that may identify an individual, duration of observation, locations, direction of travel, any bands found in pellet/scat contents, and any hazing or trapping details. Gull flocks near the nesting areas are also monitored to identify potential predators of eggs or chicks.

Some standard predator management activities conducted in the HCP area include removing animal carcasses, which attract scavengers in or adjacent to CLTE and/or SNPL nesting and chick-rearing habitat, and hazing predators to flush (i.e., avian predators) them from sensitive areas. Hazing of predators is conducted using techniques including firing a bird whistler and waving arms and making noise while approaching an avian predator on foot or by vehicle. A bird whistler is a handheld launcher that fires a projectile 250 to 300 feet and makes a loud “screech” sound; it emits a bright light and trail of smoke when fired, without harming the bird. The bird whistler can be fired from a vehicle, which can limit disturbance to SNPL and CLTE when it would otherwise be disruptive to approach a predator on foot in breeding habitat.

When additional options for controlling predators are needed, selective live-trapping and relocation of avian predators is conducted by a contractor with the appropriate authorizations to conduct these activities, and selective live-trapping and relocation or lethal removal of mammalian and avian predators is conducted by USDA Wildlife Services or other approved contractors.

Trapping is the most commonly used method for mammalian predator management. Mammalian predators, especially coyotes, may also be lethally removed by calling and shooting them. Calling is most effective at dawn or dusk. Spotlighting is also used to locate and remove mammalian predators. Spotlighting is done while driving a vehicle and shining a high-powered spotlight to look for eyeshine of a predator. Once eyeshine has been located, binoculars are used to make a positive identification, and the predator can then be removed using the above techniques.

Hazing is the most commonly used method for avian predator management. Avian predators that are perched in sensitive areas are almost always flushed or hazed with the bird whistler device before any trapping attempts are made. Only those avian predators that are not deterred from the nesting habitat and are observed targeting or disturbing SNPL and CLTE are candidates for removal. Prior to trapping avian predators for removal and relocation, avian predator justification forms are submitted to CDFW. Avian predators, such as gulls and ravens (*Corvus corax*), may also be lethally removed. Removal of avian predators is conducted under a USFWS depredation permit. An avian predator capture and relocation form is submitted to CDFW once the avian predator is released.

Non-breeding Season Monitoring of Snowy Plover

During the months of October through February, the entire SVRA is monitored weekly for SNPL; the open riding area is surveyed daily, as staff levels and weather conditions allow. During the weekly surveys, monitors drive vehicles to search for non-breeding SNPL, including any foraging and/or roosting flocks, from north of the Pismo Pier to the southern boundary of the SVRA (section 5.4.1.1.2). In addition, daily surveys of the open riding area are conducted, and staff and managers are informed of flock locations. As part of this monitoring effort and at the discretion of an experienced monitor, additional speed limit or protected wildlife signs are posted near foraging and/or roosting flocks of wintering SNPL, and enforcement is increased in these areas, as feasible.

Habitat Enhancement

Following the SNPL and CLTE breeding season (i.e., during October through February), camping, street-legal vehicles, and OHVs are once again allowed in the open riding area portion of the Southern Exclosure.[24] Recreational use in this area results in large areas of flattened terrain and barren sand with very limited scattered debris and vegetation. As a result, each year in February or March prior to nest initiation, Oceano Dunes SVRA staff place material in the 6, 7, and 8 Exclosures to enhance SNPL and CLTE habitat and offer more areas of cover for SNPL and CLTE that can provide shelter from wind and blowing sand, reduce exposure to predators, and augment potential nesting substrate. Habitat-enhancement activities consist of adding natural materials, such as driftwood, woodchips, and wrack to the exclosures and shoreline. No habitat enhancement occurs within 100 feet of the Southern Exclosure fence that borders the open riding area in order to discourage CLTE and SNPL from nesting near activities that could disturb breeding birds.

Wrack and Talitrids

Results from studies conducted by Dr. Jenny Dugan and Dr. Mark Page (Marine Science Institute at the University of California Santa Barbara) suggest the 7-month closure of breeding habitat during the breeding season is not a sufficient period of time for invertebrates, which are a food source for SNPL, to effectively recover species diversity and abundance along the Southern Exclosure shoreline following natural winter population declines along with the 5 months of recreational use. As a result, Oceano Dunes SVRA staff install wrack on the Southern Exclosure shoreline to increase the food resources available for SNPL chicks and juveniles during the breeding season. Wrack is collected from the open riding area and placed on the Southern Exclosure shoreline of the at the beginning of the breeding season to provide cover for nesting SNPL and CLTE. In addition, the wrack is inoculated with talitrids (commonly called beach hoppers), which are a primary food source for SNPL. The talitrids are collected from outside the vehicle use area north of Grand Avenue and from South Oso Flaco, taking care not to deplete talitrid numbers from collection sites. Collection of wrack and talitrids is done by hand. Wrack is moved from the open riding area to the Southern Exclosure using a truck and trailer.

Woodchips, Branches, and Driftwood

Woodchips are added to the 6, 7, and 8 Exclosures in areas of barren sand and over thinning woodchip patches from the previous years. Heavy equipment is used to load woodchips onto trucks for transport to the exclosures. Oceano Dunes SVRA staff also distributes cut branches and driftwood in patches from

[24] CDPR administratively closed this area in 2021 temporarily in response to now-concluded permitting and litigation. This HCP anticipates the area will return to seasonal operation if such operation is consistent with the requirements of other programs.

the mid-portion of the 6 Exclosure and 7 Exclosure to the west seasonal exclosure fence and upper Southern Exclosure shoreline. Staff collect the branches and driftwood from the Southern Exclosure at the end of each breeding season and store them for use in the following breeding seasons.

Plants and Seeds

In past years, prior to expected rain, CDPR has broadcast seed and installed container plants in the 6 Exclosure and 7 Exclosure in order to provide additional cover for SNPL and CLTE during the breeding season. All seeds and container plants are collected from local foredune species, such as sea rocket (*Cakile maritima*), beach bur (*Ambrosia chamissonis*), and sand verbena (*Abronia maritima*). Although sea rocket is non-native, the annual plant is not invasive in the HCP area and is beneficial as to improved nesting habitat because, like other native foredune plants, it grows quickly during one nesting season. Seed and container plant collection and dispersal is conducted by hand using hand tools. Planting and seeding the exclosure areas have not been necessary in recent years.

Modifications to Habitat Enhancement Approaches

CDPR will continue to adjust approaches to habitat enhancement in response to data collected, input from Wildlife Agencies and other resource specialists, and site conditions (see adaptive management described in section 5.5.6). The perfect combination of open sand, microtopography, and scattered vegetation and debris is not fully known and has not been formally studied in the HCP area. Observations in the HCP area do indicate that once a foredune system creates significant topographic relief and dense vegetation, it is less productive for nesting SNPL and CLTE (CDPR 2023). Large portions of the Southern Exclosure have become less productive as the vegetation and topography have expanded and grown over time, causing reduced open habitat favored by nesting SNPL and CLTE. CDPR anticipates needing to remove during the non-breeding season the non-native sea rocket and larger dune hummocks in heavily vegetated areas where nesting has reduced in the Southern Exclosure. The intent of the vegetation removal would be to mimic the natural action of creek and river mouths, which can clear out acres of vegetation in one storm event to create “blow-out” areas within the foredune habitat, extremes for which foredune habitats are adapted. This work would not occur within the Boneyard Exclosure.

Although the desired habitat improvement may be obtained from creating a few small patches (i.e., 0.25 acres) of reduced vegetation and hummocks each year, more extensive manipulation of a larger area may be necessary to restore productivity of the habitat within the Southern Exclosure. CDPR would only propose implementing a larger scale project (i.e., ≥5 acres) during the non-breeding season. Such projects would be developed in consultation with the Wildlife Agencies in consideration of compliance with all regulatory and program requirements. Project approval may also be subject to further CEQA review and permitting.

Investigation of SNPL and CLTE Carcasses

When SNPL and/or CLTE carcasses are discovered in the HCP area, Oceano Dunes SVRA staff collect carcasses in coordination with USFWS and/or CDFW. Carcasses may be stored in a freezer and/or sent to an approved facility for necropsy (see section 5.4.1.8).

2.2.2.1.3 Tidewater Goby and Salmonid Surveys (CA-13)

CDPR biologists routinely monitor covered species populations and habitats, including covered fish species. The fish habitat of the lowest half-mile of Arroyo Grande Creek, including the euryhaline lagoon within Pismo State Beach, is sampled and monitored about four times per year for native species including tidewater goby and salmonids. Qualitative sampling of the fish in this area is conducted to

gather information about various species' use of the habitats, to evaluate whether any park activities may be impacting the fishery or aquatic habitat, and to document the impacts of habitat disturbance caused by upstream water management activities. The sampling effort regularly includes seining, dipnetting, and direct observation. Electrofishing in upstream areas is also conducted when streamflows and other conditions (e.g., turbidity, temperature, etc.) are suitable. The Oceano Dunes District may also conduct fish surveys within Pismo Creek and estuary, Carpenter Creek, or Oso Flaco Lake and Creek to check for covered species' presence and to document overall species diversity. Monitoring of tidewater goby is covered by the USFWS Recovery Permit (TE-815214-10 and TE-101154-3; Appendix D) and any impacts to covered species from this activity will be addressed through the respective permit. Electrofishing for steelhead is covered under a FESA Section 4(d) authorization from National Marine Fisheries Service to the California Department of Fish and Wildlife under their Scientific Collecting Permit program.

Additionally, CDPR will monitor estuary conditions and, in consultation with USFWS and CDFW, salvage tidewater gobies deemed vulnerable from low water conditions to suitable habitats within the same or adjacent watersheds that support tidewater goby (see section 5.3.2.1.4).

2.2.2.1.4 Monitoring and Management for Listed Herpetological Resources (CA-14)

A comprehensive survey to document presence of CRLF in potentially suitable habitat, numbers of individuals, quality of habitat, and habitat disturbances (if any) is conducted as time and staff allow. A full park survey can occur annually if SVRA staff are available and resources allow. Surveys are conducted at all known and potential CRLF habitats (e.g., Pismo Lake, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Meadow Creek, Carpenter Creek, Oceano Lagoon, Pismo Creek Lagoon, Pismo State Beach Golf Course, Dune Lakes, and Arroyo Grande Creek and Estuary). Surveys typically begin in January and are completed by the end of September. Multiple survey visits are conducted throughout this survey year. Two daytime surveys and four nighttime surveys are recommended during the breeding season between October 1 and June 30, and one daytime and one nighttime survey are recommended during the non-breeding season between July 1 and September 30. At least one survey is conducted prior to August 15. All surveys are visual unless a CRLF is observed. If a CRLF is observed, a 10 (a)(1)(A) permitted (or USFWS-approved) Oceano Dunes SVRA biologist or contractor may conduct dipnet surveys.

During visual and dipnet surveys, the surveyor walks along the entire shore or bank, visually scanning all shoreline or streambank areas and/or uses kayaks to survey appropriate habitat along the shoreline, as necessary when the shoreline is inaccessible. When duckweed or other floating vegetation is present, the surface of the water is scanned. Care is taken not to disturb sediments, vegetation, or any visible larvae. When walking on the bank, care is taken not to crush root balls, overhanging banks, and streamside vegetation that might provide shelter for frogs. When conducting night surveys, flashlights and headlamps requiring four to six D batteries or one 6-volt battery are used in order not to harm frogs with bright spotlights (USFWS 2000a). Acoustic monitoring and e-DNA sampling may also be implemented. CRLF surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit for CRLF or a biologist previously approved by the USFWS. These surveys will be conducted consistent with the USFWS survey guidelines (USFWS 2005b) and the Declining Amphibian Task Force Fieldwork Code of Practice (Appendix J; (USFWS 2005b). Any impacts to CRLF from these surveys would be addressed through this permit.

A full park survey for SWPT can occur annually if SVRA staff are available and resources allow, including visual, basking, dipnet, and other similar survey techniques. Funnel traps or similar methods may also be deployed to capture SWPT in all standing water bodies throughout the HCP area. Surveys will be conducted in accordance with the protocols outlined in *USGS Western Pond Turtle (Emys marmorata)*

Visual Survey Protocol for the Southcoast Ecoregion (2006a), *USGS Western Pond Turtle (Emys marmorata) Trapping Survey Protocol for the Southcoast Ecoregion* (2006b), or updated protocols then in effect. Other methodology, such as e-DNA sampling, may be used. These surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit for SWPT, if required, or a biologist approved by the USFWS. These surveys will be conducted consistent with the Declining Amphibian Task Force Fieldwork Code of Practice (USFWS 2005b); see Appendix J.

Since not much is known about the breeding habitat or distribution of WSF within the HCP area, surveys are needed to get baseline data. Given the large area of potential habitat, site conditions, survey timing requirements, and available staffing, it is not feasible to survey the entire HCP area every year. The monitoring will thus prioritize sites for surveys taking into account feasibility of access, potential effects from covered activities, and drought/adequate rainfall effects on survey timing. WSF spend most of the year in upland habitat in a dormant to semi-dormant state underground and in small mammal burrows adjacent to seasonal rainpools. They typically go undetected until they emerge during early winter to early spring rain events and find breeding habitat with temporal standing water. Survey methods will likely include visual encounter surveys conducted in the evening after rainfall events (Department of Defense 2022) and monitoring of known or potential breeding pools. WSF eggmass and tadpole surveys would be conducted in seasonal rainpools that last a minimum of four weeks like dune slack wetlands, and temporary water features like small ponds. Acoustic monitoring, e-DNA sampling, pitfall traps, or other techniques may also be implemented. These surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit for WSF, if required, or a biologist approved by the USFWS. These surveys will also be conducted consistent with the Declining Amphibian Task Force Fieldwork Code of Practice (Appendix J; (USFWS 2005b) and also in accordance with the protocols outlined in *USGS Protocol for Nocturnal Aquatic Species of South Coast Ecoregion Rivers, Streams, and Creeks* (USGS 2006c).

SWPT and WSF surveys are not currently authorized under the USFWS Recovery Permit, but this permit will be amended during the HCP term to include this activity. Future impacts from SWPT and WSF surveys will be addressed through the Recovery Permit.

2.2.2.1.5 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Vegetation management activities in known and potential covered species' habitat include removing invasive plants such as iceplant (*Carpobrotus edulis*), veldt grass (*Ehrharta calycina*), and European beach grass (*Ammophila arenaria*) via herbicide application and hand weeding and by re-establishing native plants in areas where exotic plants have been removed. Invasive weed control could occur in any occupied or historic occurrences of listed plants using best available practices. These practices may include use of grass-specific herbicides when listed plants are present and use of post emergent herbicides in locations where listed plants do not currently occur but have occurred in recent years, which prevents negative impacts to the listed plants and seed bank. Prescribed fire may also be used to remove invasive plants. For example, in December 2009, CDPR Natural Resource staff implemented an approximately 160-acre prescribed burn in the foredunes south of Oso Flaco Lake prior to applying herbicide on European beach grass to improve habitat for beach spectaclepod (*Dithyrea maritima*) and surf thistle (*Cirsium rhothophilium*) (CDPR 2012a).

Perennial veldt grass, which is the greatest threat to Nipomo Mesa lupine recovery, has been managed within occupied habitat for Nipomo Mesa lupine since 2016 under a CESA Scientific, Educational, or Management Permit, currently No. 2081(a)-21-008-RP Amendment 1 Invasive Species Control for Nipomo Mesa Lupine Recovery. Under the existing permit, perennial veldt grass management is limited to treatment with ground application of grass-specific herbicide outside of a 15-foot herbicide free buffer around live Nipomo Mesa lupine plants and point locations of plants from the previous 5-years and hand pulling of veldt grass after the growing season for the covered species once the plants have

desiccated. This current treatment strategy has resulted in "veldt islands" in the extant stands of Nipomo Mesa lupine, leaving the population vulnerable to displacement by perennial veldt grass. During the term of the HCP these treatment conditions may change pursuant to potential CESA permit amendments or issuance of new CESA permits.

Perennial veldt grass may be targeted with the grass-specific herbicide clethodim where Nipomo Mesa lupine is actively growing. In 2019, Cheadle Center for Biodiversity and Ecological Restoration at the University of California at Santa Barbara (CCBER) partnered with CDPR and conducted a controlled nursery study to determine the effects of the grass-specific herbicide clethodim on Nipomo Mesa lupine plants (CDFW permit 2081(a)-19-017-RP). For this study, Nipomo Mesa lupine seedlings were exposed to clethodim at the label specified rate for treatment of perennial grasses, and it was determined that there was no effect on vigor, lifespan, seed production, or seed viability (Stratton, Lippitt and Chapman 2020). For this activity (CA-17), exposing live Nipomo Mesa lupine plants and the seedbank to the clethodim would be covered.

Being a springtime annual plant, Nipomo mesa lupine plants desiccate by early summer and do not return until significant rainfall returns in the fall (typically a >0.5 inch rain event), initiating germination of a new generation from the seed bank. Once Nipomo Mesa lupine plants naturally desiccate in the early summer, it may be advantageous to use a general use post-emergent herbicide, typically glyphosate, within these areas to target perennial veldt grass with mature foliage, which is less affected by certain grass-specific herbicides than young foliage. Additionally, late season use of broadleaf post-emergent herbicide may be used to act with a different mode of action to prevent veldt grass from becoming resistant to the grass-specific herbicide. Other broadleaf invasive plants may also be targeted in these areas including iceplant, narrow leaved iceplant (*Conicosia pugioniformis*), and tocalote (*Centaurea melitensis*). Prescribed fire is used where it is the appropriate management tool to control invasive species, such as European beach grass. Fire can be used alone or serve as an effective tool to reduce the amount of aboveground biomass prior to, or after, herbicide application. Implementing a broadcast burn can greatly reduce the amount of work and resources required to manually remove vegetation and the amount of herbicide required for control.

As part of the listed plant, propagation, and habitat enhancement program, CDPR will actively participate in the recovery of listed plant species. As a result, restoration of native habitats may include propagation and planting of listed species for recovery purposes only. Propagation will involve seed or plant material collection, greenhouse cultivation, record keeping, and ultimately experimental transplanting of listed plant individuals. A Restoration and Monitoring Plan for experimental planting of listed plant species will be developed in coordination with the Wildlife Agencies and in accordance with federal and state regulations protecting listed plant species.

Regular monitoring of listed plant populations in the HCP area will also occur. Monitoring listed plant populations requires entering occupied habitat and measuring critical information about listed plant populations and their associated plant communities. Other management activities may include trimming vegetation away from listed plant populations to promote recovery, as well as other actions deemed necessary to protect and enhance existing listed plant populations. Vegetation management frequently requires vehicle access off of designated roads, including access into remote areas through potentially sensitive areas.

2.2.2.2 Habitat Restoration Program (CA-16)

Since 1989, Oceano Dunes District has annually implemented stabilization projects to control the sand movement within vegetated areas of the dunes and restoration projects to maintain the integrity of native dune and riparian habitats located within or adjacent to the open riding area of Oceano Dunes SVRA and Pismo State Beach. Oceano Dunes District maintains a basic greenhouse and nursery

operation. Native seed and plant propagation materials for plants used in the restoration projects are harvested within the boundaries of the park.

Over the years, restoration projects have varied from stabilizing large bare sand sheets or sand encroachment along the edges of a vegetated island to restoring areas with potential soil or habitat loss due to construction, access roads, high winds, high tides, weed encroachment, and other factors. Table 2-4 summarizes the restoration efforts in the HCP area from 2011 through spring 2024.

The vegetation islands range in size from less than an acre to over 90 acres and are only open to pedestrians and dogs on leash, unless specifically posted closed. In addition, Oceano Dunes District resource staff and affiliated biologists enter the areas for monitoring and management purposes. Exterior fencing must also be maintained as the shifting dune sand often undermines or overtops the fencing. Restoration activities conducted in the vegetation islands include minor grading to access work areas, seed collection, propagation, planting, and monitoring.

Oceano Dunes District has established a protocol for the materials used and how they are applied at the targeted sites. Prior to the spread of seed or installation of plants, park crews along with California Conservation Corps, American Conservation Experience, or CalFire crews, spread or hand punch Certified Weed-Free wheat straw over the project. Rice straw may also be used in upland restoration projects as it is grown in flooded fields, which are not expected to support weeds that could proliferate in non-wetland coastal dune habitats. Planting is dependent on seasonal rains and is site specific. Species used include silver lupine (*Lupinus chamissonis*), yarrow (*Achillea millefolium*), Blochmans groundsel (*Senecio blochmaniae*), mock heather (*Ericameria ericoides*), crisp monardella (*Monardella undulata* ssp. *Crispa*), arroyo willow (*Salix lasiolepis*), and others. Machine or hand broadcasting of sterile grain seed (typically Quickguard or Re-green brands, 15*15*15 granular fertilizer, and native seed follows planting. In 2014 or 2015, biodegradable erosion control blankets were installed on the steep and wind-swept slopes found at Indian Midden, Maidenform, and North Boy Scout with the intention of reducing the amount of sand loss from wind off the slope and encouraging seed recruitment and germination on the slope. Jute netting has been shown to be a successful substitute for erosion control blankets and may be used during the permit term.

Table 2-4. Recent Restoration Efforts within the Oceano Dunes District

Year	Acreage	Number of Plants	Seed (lbs.)	Fertilizer (lbs.)	Sterile Grain Seed (Re-Green/ Quickguard)	Number of Straw Bales	Blankets
2011/12	8.63	16,263	*199 gallons*	1,200	1,000	*1,854	–
2012/13	12.9	19,232	180	695	1297	*1,696	–
2013/14	17.52	10,003	155	578	578	*1,274	–
2014/15	13.75	12,127	106	725	300	*1,049	20 rolls
2015/16	9.69	16,737	112	550	550	*1,536	10 rolls
2016/17	5.76	10,079	114	200	250	*1024	–
2017/18	8.84	5,108	209	1,530	1,014	*884	–

Table 2-4. Recent Restoration Efforts within the Oceano Dunes District

Year	Acreage	Number of Plants	Seed (lbs.)	Fertilizer (lbs.)	Sterile Grain Seed (Re-Green/ Quickguard)	Number of Straw Bales	Blankets
2018/19	7.31	19,350	46	475	475	*325	–
2019/20	4.61	16,516	67	400	400	*170, **36	–
2020/21	14.2	35,759	174	570	570	**178	–
2021/22	1.12	2,646	6	50	50	**16	-
2022/23	0.3	618	1.2	-	-	-	-
2023/24+	3.4	2,374	34	100	100	-	-

Notes:
*small bales (12ft^3);
** large bales (96ft^3)
+Data through January 2024

The District performs these activities to enhance the habitat characteristics of existing vegetation islands present within Oceano Dunes SVRA, as well as to protect sensitive habitat areas (such as Oso Flaco Lake) and critical park infrastructure (such as access roads) from encroaching sand dunes. Most of the installed vegetation has been planted on sandy areas adjacent to existing vegetation islands or other vegetated areas in the southern half of Oceano Dunes SVRA. Vegetation planting associated with the habitat restoration program is anticipated to continue over the permit term as shown in Table 2-4.

CDPR also proposes restoring dune slack wetland associated with either Jack Lake or Surprise Lake. By establishing deep pool habitat with transitional banks and swales, and by addressing invasive aquatic vegetation and predators, the restoration will support rare aquatic species, including SWPT, CRLF, WSF, La Graciosa thistle, and marsh sandwort (see section 5.3.2.1.3).

Specific habitat restoration activities are also proposed for approximately 300 acres of Pismo State Beach (including at Pismo Lake) as part of a Public Works Plan (PWP) developed under the California Vegetation Treatment Program (CalVTP). This CalVTP area (see Map 8) is targeted to reduce fuels in the wildland urban interface and to promote ecological restoration of this area. The dune area treatment between Carpenter Creek south to Pier Avenue is intended to restore foredune and dune scrub habitat in an area that has become laden with fuels from non-native acacia, iceplant, and European beachgrass. The area associated with Pismo Lake has developed high fuel levels that impact the adjacent aquatic, oak woodland, oak savannah, and coastal sage scrub habitats. Treatments will include hand removal of fuels and non-native vegetation, mechanical removal of non-native vegetation, prescribed fire, and herbicide application to restore these areas to more naturally functioning native habitats. The CalVTP project areas are not known to support any of the covered species under this HCP, although some of these areas are mapped as suitable upland habitat for SWPT, CRLF, and WSF.

2.2.2.3 Invasive Plant and Animal Control (CA-17)

In addition to the vegetation control measures conducted as part of the Routine Riparian Maintenance Program (section 2.2.3.7) and vegetation management specifically targeting covered species (section

2.2.2.1.5), Qualified biologists/Natural Resource staff manage the plant and animal communities within the park to control invasive species and to generally improve ecosystem health. An invasive plant or animal is a species that has or is likely to spread into native systems and cause economic or environmental harm by developing self-sustaining populations and becoming dominant or disruptive to those systems. Invasive animal species such as crayfish (*Procambarus clarkii*), warm-water fish, American bullfrogs (*Lithobates catesbeiana)*, and feral pigs (*Sus scrofa*) may be removed by trapping or other means. Implementing a comprehensive invasive species control program is a key way to offset the impacts from the take requested through this HCP. Invasive predators are removed opportunistically during surveys and other chance events. Invasive predators are also removed as part of a comprehensive management program to identify threats to covered species from invasive animals and control of invasives in key habitats. This focused approach maximizes the value of those habitats to covered species. Invasive animal removal is part of the adaptive management framework that CDPR implements to identify and manage threats to benefit the covered species.

Manual removal, herbicide application, and prescribed fire may all be used to control invasive plants, such as perennial veldt grass, European beach grass, and iceplant (*Carpobrotus spp.*). These activities may require hand clearing of paths to access work areas.

Herbicide applications and manual removal of invasive plant species may occur within occupied habitat of covered species using best practices. See section 2.2.2.1.5 for a discussion of invasive exotic species control specifically to benefit listed plant species.

2.2.2.4 Wildlife Habitat Protection Plan Implementation (CA-18)

The OHMVR Division is required to establish both soil loss standards and a WHPP for each SVRA. The Oceano Dunes SVRA WHPP, which is currently being updated, formed the basis for the current WHPP. The WHPP has been developed to standardize a broad range of scientifically accepted techniques and practices appropriate for monitoring the health of the unique habitats found within the HCP area. Ecological monitoring and data collection involve a set of systematic surveys repeated over time in an effort to detect changes or trends in biotic or abiotic components of an ecosystem. Monitoring provides an early warning of potential problems, which can then be corrected before conditions are seriously degraded. The purpose of an ecological monitoring program is not necessarily to be exhaustive by recording every plant or animal species, but to obtain information on representative organisms as indicators of ecological health and possible significant ecological changes (Elzinga, et al. 2001).

In order to keep pace with the current state of best practices, resource specialists must regularly review and update protocols, thereby improving the effectiveness and efficiency of the monitoring program. The Oceano Dunes WHPP incorporates “control” monitoring sites (i.e., undisturbed sites of similar vegetation/wildlife habitat, where OHV recreation is not allowed) and compares conditions in these control sites to treatment sites (i.e., sites where OHV riding occurs). This program includes the establishment of permanent control monitoring plots at the Dunes Preserve, the Oso Flaco Lake area, Phillips 66 Refinery property, and the protected foredune region north of the mouth of Oso Flaco Creek. The monitoring program includes continued annual and seasonal monitoring at known locations for listed plant species, tidewater goby, steelhead, and for CRLF where permanent control monitoring plots have been established. WHPP surveys also include control and treatment locations for small mammal trapping, terrestrial bird point counts, and shorebird counts. The CLTE and SNPL monitoring program is also part of the WHPP. An additional element of the Oceano Dunes SVRA WHPP incorporates analyzing and assessing the effects of management practices, especially vegetation planting and invasive plant management.

2.2.2.5 Water Quality Monitoring Projects (CA-19)

The Oceano Dunes District is implementing a surface water protection program as well as an illicit discharge detection program with a water quality monitoring component. Water quality sampling includes using handheld sensors or filling containers for analysis by a lab. Most monitoring is completed from the shoreline of the water body being tested. Other water quality monitoring projects could include grab samples, flow measurements, and installation of continuous meters in water bodies throughout the HCP area. Section 2.2.5.8 discusses the installation of a bioreactor downstream of the leased agriculture lands, which works to improve water quality in the Oso Flaco Lake system. Other water quality improvement projects resulting from water quality monitoring are not known at this time and would be subject to a separate regulatory evaluation.

2.2.3 Park Maintenance

Park maintenance activities include maintaining campgrounds, ramps, roads, and trails; collecting garbage; erecting and maintaining fences; and riparian vegetation maintenance. Each activity is described in more detail in the following sections.

2.2.3.1 Campground Maintenance (CA-20)

Campground maintenance activities include mowing, implementing a hazardous tree program, restroom upkeep, and housekeeping. The hazardous tree program entails routine tree inspections. Limbs and whole trees are removed, as needed, to eliminate hazards. Additionally, campground maintenance includes water and sewer line repair/replacement, fencing/barrier and signage installation, and other ground disturbing activities.

2.2.3.2 General Facilities Maintenance (CA-21)

CDPR maintains facilities and infrastructure that support public activities throughout the HCP area. Ten locations with vault toilets exist within the open riding area. The footprint of each vault toilet is approximately 8 by 8 feet. Road base is added around vault toilets during installation within a roughly 5-foot perimeter to provide access and prevent undermining by the strong winds. The road base is generally buried by sand quickly after toilet installation and is no longer visible. Chemical toilets, approximately 4 by 4 feet, are also located within the open riding area where needed and are typically placed on pallets.

Other routine and minor maintenance activities include building maintenance; minor vegetation clearing around buildings; replacing fencing, signposts, and information kiosks; and maintaining structures such as sheds. These ongoing maintenance activities are completed on an as-needed basis. The frequency of this work depends on visitor usage and/or any weather-related damage. Maintenance areas also include sites like the levee and trail from Grand Avenue to Pismo Beach, underground infrastructure to support the corporation yard and developed campgrounds, fences around areas like the corporation yard, and a network of formal trails around Oceano Lagoon and the Grand Dunes. Maintenance of these facilities could include minor grading.

CDPR will be using a tractor-towed rake or similar device during daylight hours only to collect nails, broken glass, and other debris from open sand areas that may pose a hazard to visitors or wildlife. Mechanical trash removal will only occur above the wrack line in the Grand Avenue and Pier Avenue entrance areas, the Post 2 trash dumpster areas, and Post 2 south to Post 4.5. In addition, mechanical trash removal will also occur in the open area to Post 6, which is east of the 48-acre foredune area. Mechanical trash removal operations are designed and implemented to occur seasonally, from February through May and September through December. These timeframes establish general periods where the greatest effectiveness and efficiency of mechanical trash removal activities is expected. These

timeframes consider winter rain periods (December through February), which may make mechanical trash removal activities less effective, and summer visitation (May through September), which may make mechanical trash removal activities less efficient with increased visitor attendance. Mechanical trash removal will not occur within vegetated areas or within any fenced closed areas where known SNPL or CLTE nesting occurs (such as the Southern Exclosure or 48-acre foredune area). Lagoon and creek areas are also avoided. Mechanical trash removal activities are designed to avoid known seasonal nesting SNPL or CLTE, to prevent any disturbance, and to prevent any mechanical trash removal activity related conflict. Equipment operating speed is approximately 3 to 5 mph and will not exceed 10 mph. Collected debris will be deposited in the dumpsters. It is expected that work will be conducted in the morning to avoid peak visitation. A maximum of approximately 10 to 20 acres could be treated on any one day. Given time constraints, speed limits, and other factors, fewer acres may be treated. In most cases, particular areas should be cleaned no more than twice a year, unless extenuating circumstances (large amounts of broken glass, etc.) require additional mechanical trash removal. Although trash removal would focus on a narrow (200- to 300-foot-wide), approximately 140-acre band running from Grand Avenue to Post 6 (with the exception of the shoreline area from Post 4.5 to Post 6), other areas may be treated pending resource staff review and within the above setback parameters. CDPR has been implementing limited mechanical trash removal on a trial basis since October 2019 to evaluate and refine these protocols.

2.2.3.3 Trash Control (CA-22)

Maintenance crews pull 20-cubic-yard roll-off dumpsters onto the dunes just south of Post 2 for trash control. Normally two to four dumpsters are deployed, but more are used as required to contain trash, depending on events and holidays. The dumpsters occupy up to 0.25 acre of sand. The dumpsters stay for a week, at which time they are hauled away by trucks to be emptied and then brought back and replaced in the sand, depending on the expected number of visitors. Given high winds in the HCP area, trash can blow out of the dumpsters. Uncovered trash dumpsters could also attract a large number of gulls that land and forage in the dumpsters (CDPR 2017a). Since 2021, CDPR has deployed covered dumpsters that open from the side, which has been found to attract fewer gulls than the previous design. Dumpsters were originally locked at the end of the visitor services night shift to reduce scavenging and unauthorized night dumping. Dumpster locks are not currently in use, but if public scavenging, unauthorized dumping, or predators become an issue, CDPR will reconsider locking the dumpsters at night.

Smaller trash bins are transported in a pick-up truck and placed in the non-motorized portion of Pismo State Beach. Garbage pickup is occasionally required along various creeks or other areas where trash collects. This effort is completed on foot with handheld trash bags.

2.2.3.4 Wind Fencing Installation, Maintenance, and Removal (CA-23)

The Oceano Dunes District installs approximately 1,700 linear feet of wind fencing directly upwind of Grand Avenue, Pier Avenue, and Strand Way annually from March to July (Map 4). The fencing material is stretched across fence poles in approximately 80-foot sections. This wind fencing is installed to control natural sand drift from the beach onto public roads, parking areas, and other structures such as residences that front the southern portion of Pismo Beach. Maintaining the wind fencing requires ongoing grading to remove sand, depending on the wind strength and direction. The Oceano Dunes District may use heavy equipment to move and distribute sand that has accumulated in wind fencing projects throughout the park. The sand is typically distributed in front of the wind fencing and above the mean high tide line.

2.2.3.5 Sand Ramp and Other Vehicular Access Maintenance (CA-24)

At Pismo State Beach, vehicles access the beach via the sand ramps at Grand Avenue and Pier Avenue. The sand ramps are maintained as needed, sometimes as often as daily, to ensure safe vehicular access. Excess sand is scraped off the ramp and deposited above the mean high tide line, and road base is added to the face of the sand ramps for traction. CDPR vehicles also access the beach via the Midramps entrance from Oceano Campground north of Pier Avenue. The Midramps access is also maintained by grading and removing less than 50 cubic yards of sand. Road base is added as needed. In addition, CDPR staff create transportation corridors (approximately 80 to 100 feet wide) during holidays to ensure ingress and egress for CDPR vehicles.

Roadway and parking lot resurfacing occurs as needed within the HCP area. In addition to adding road base to the sand ramps, it is installed in and around the maintenance yard. These areas within the HCP area, including the dirt lot at Grand Avenue, the Pismo State Beach monarch grove, the maintenance yard, the ranger station, and the Oso Flaco Lake parking lot, are also graded and resurfaced with road base, as needed. Some trails, such as the Grand Dunes Trail, also require grading or resurfacing. At Oso Flaco Lake, vegetation removal is required and an ongoing activity along the access road. Road base is also added to the northern end of the Oso Flaco Lake access road approximately 4 feet from the road's edge to ensure continued accessibility.

2.2.3.6 Street Sweeping (CA-25)

The Oceano Dunes District operates a street sweeping program to remove sand that accumulates on Grand Avenue in the City of Grover Beach and on Pier Avenue in the community of Oceano. District staff operate a small, CDPR-owned, street sweeper from the Grand Avenue and Pier Avenue entrance stations to the sand ramps leading to the beach (a distance of approximately 100 feet) two to three times per week. The Oceano Dunes District also conducts or contracts street sweepers outside of the HCP area.

2.2.3.7 Routine Riparian Maintenance (CA-26)

The Oceano Dunes District implements the following riparian maintenance activities on an as-needed basis (Map 7; (CDPR 2012b):

- *Pismo Lake Spillway Maintenance*. Routine maintenance is occasionally needed to remove vegetation, sediment, and other debris blocking the concrete rip-rap spillway located within Pismo Lake to prevent flooding the lake. Ongoing maintenance within the spillway is limited to manually removing cattail root balls, dead and downed wood material, and other debris or sedimentation in the spillway. Crews enter the spillway using either hand or hand-power tools to trim obstructing branches from trees and shrubs along the spillway. A chainsaw may be needed if a fallen tree or a large limb is blocking the spillway.
- *Culvert Maintenance*. Culverts are cleaned of debris, vegetation, and sediment on an as-needed basis. Cleanout includes the following sites within the HCP area: 2 culverts at Oso Flaco Lake, 2 culverts at the Meadow Creek access road, and 11 culverts at Meadow and Carpenter Creeks in the North Beach Campground. Culverts are cleaned manually or, for larger jobs, by using a backhoe. All backhoe work occurs from the road, trail, or upper bank outside the wetted stream channel; therefore, only the backhoe bucket enters the water body to lift and remove obstructing objects. The backhoe accesses all project sites from existing roads or trails.
- *Riparian Tree and Shrub Maintenance*. This activity involves removing dead and downed trees, trimming obstructing or damaged limbs less than 4 inches in diameter, and trimming tree canopies. This work happens at the Oso Flaco Lake area; Oceano Lagoon; and within Meadow

Creek at the North Beach Trail, maintenance yard, and ranger station. Shrubs are cut up to 4 feet from the edge of the road, path, or trail. Crews use hand and power tools. Some mechanized equipment, such as mowers may be used, but only in areas where an existing roadway provides access to maintenance areas.

- *Emergent Species Control*. Growth of emergent plants within Meadow Creek and Carpenter Creek in Pismo State Beach is managed to prevent the vegetation from choking up the creek and to allow water to move through the creeks unhindered. Work is conducted using handheld tools and occurs in the stream channel only during low or no-flow conditions. Future work may include using herbicides labeled for aquatic use or limited use of heavy equipment operating from the banks.
- *Invasive Plant Control*. This activity involves removal or management of invasive plants, including Cape ivy (*Delairea odorata*), Boston/English ivy (*Hedera helix*), Pampas grass (*Cortaderia selloana*), and Italian thistle (*Carduus pycnocephalus*) from within the riparian plant community. The work occurs at Grand Avenue, the Oso Flaco Lake area, Oceano (Lagoon, and Meadow Creek. OHMVR Division hires a qualified and licensed pesticide contractor experienced in working within a riparian plant community for the manual and chemical treatment of these invasive plant species. Chemical treatment involves a contractor applying an herbicide from a backpack sprayer at each location where removal of these species has been identified as necessary. OHMVR Division staff also perform manual treatment (e.g., pulling by hand, weed trimming) of these plant species. The acreage of both manual removal and herbicide application varies from year to year.

Spillway maintenance, culvert maintenance, and emergent species control activities are conducted on an as-needed basis, affecting a maximum of approximately 0.3 acre of wetlands annually (Map 7).

Approximately 2 miles of creek corridor are subject to riparian tree and shrub maintenance and spot treatment to control invasive plant species. This work occurs seasonally as needed.

All work within the stream channels occurs during the driest part of the year, usually between July 1 and December 1. Tree trimming activities occur between October 1 and March 1, outside of the migratory breeding season, as feasible. Some tree trimming could occur within the breeding season, however, in areas where surveys by qualified biologists/Natural Resource staff have determined no breeding activity is occurring. The U.S. Army Corps of Engineers has reviewed these activities and determined that they do not involve a discharge of dredged or fill material or affect areas subject to the ebb and flow of the tide. As a result, these routine riparian maintenance activities are not regulated under section 404 of the Clean Water Act or section 10 of the Rivers and Harbors Act.

2.2.3.8 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

In addition to the fencing described previously, such as the seasonal exclosure and wind fencing (sections 2.2.2.1.1 and 2.2.3.4), Oceano Dunes District staff maintains miles of additional fencing and other barriers. Such fencing includes perimeter fencing around the parks and campgrounds, as well as fencing around the vegetation islands. The fencing consists of field fencing, peeler poles, and T-posts. All fencing must be maintained, including by removing sand to ensure the fences are not buried and by replacing the fences as needed. Due to sand movement, fencing may not always be replaced in the exact same location but is aligned to maintain consistent boundaries.

2.2.3.9 Cable Fence Maintenance and Replacement (CA-28)

A cable boundary fence in Oceano Dunes SVRA, which is located on the shoreline along the southern boundary of the open riding area at Post 8, prevents vehicular and equestrian intrusion into the sensitive habitats in the vicinity of Oso Flaco Lake. The fenceline extends into the wave zone to provide a year-round barrier, regardless of beach width or tide levels. The southern boundary of the cable fence is mandated by the Coastal Commission Local Coastal Program (4-82-39, Condition 3.E (b)). The fence consists of a cable connecting 17 steel posts that are spaced 20 feet apart for a total length of 340 feet. The fence also contains an 18-foot steel gate.

The cable fence, at the south open riding area boundary, requires routine maintenance to remove sand that builds up along the fence line. In the summer, the beach profile builds up and the cable fence posts and gates can become overly buried. At the end of the nesting season, in late September, after all nests have hatched and chicks have fledged and just before the seasonal exclosure fencing is removed, grading may be necessary around the cable fence to ensure it is functioning properly as a barrier.

Due to harsh coastal conditions, the gate and fence may need to be replaced as frequently as every 5 to 15 years; it was last replaced in 2010. Removal of the existing 20-foot-long posts requires excavation of sand to a depth of 15 feet using an excavator and use of a pile driver or vibrating hammer to install the new posts. Construction may last approximately 3 weeks and is implemented outside of the SNPL and CLTE breeding season.

2.2.3.10 Heavy Equipment Response (CA-29)

Heavy equipment (e.g., loader, tractor) is utilized throughout the HCP area for everything from removing stranded vehicles or boats to burying deceased marine life.

2.2.3.11 Minor Grading (CA-30)

As discussed above, minor grading may occur throughout the HCP area (e.g., sand removal from fences, sand ramps (section 2.2.3.5), and the cable fence (section 2.2.3.9). In addition, other maintenance or resource needs (e.g., to access buried fencing or create a pad for chemical toilets) may require minor grading of no more than 100 cubic yards on average. Other than grading the cable fence (section 2.2.3.9) at the end of the SNPL and CLTE breeding season, grading occurs in upland, non-wetland habitat.

2.2.3.12 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Boardwalks in Pismo State Beach and Oso Flaco Lake require maintenance such as grading and repair of degraded sections. This work may be conducted on sections of boardwalk traversing upland or aquatic habitat, including both open water and wetland. Vegetation intruding onto footpaths may need to be trimmed at least once a year, which is usually completed using hand tools. Maintaining pedestrian access, including work conducted for Americans with Disabilities Act purposes, requires trail treadwork as well as culvert and footbridge maintenance and installation. Replacement of degraded sections of boardwalks at Pismo State Beach and in upland habitat in the Oso Flaco area may also be required, including the western portion of the Oso Flaco boardwalk that sits directly on the sand. Replacement of sections of the Oso Flaco Lake boardwalk over aquatic habitat is described in CA-48 (section 2.2.5.9).

2.2.4 Visitor Services

General park operations include patrolling beaches and trails; conducting public safety, law enforcement, medical aid, and emergency response activities; and providing other visitor services. These services may be conducted by CDPR personnel, contractors, other agencies, for-profit and not-for-profit

entities, concessionaires, or lessees. These activities are described in more detail in the following sections.

2.2.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

Both Pismo State Beach and Oceano Dunes SVRA are subject to regular ranger and park aide patrols throughout the HCP areas that are open to the public to ensure that visitors are obeying regulations. Patrols are largely conducted via vehicles, such as pick-up trucks, ATVs, and ROVs.

Lifeguards perform their services at their assigned lifeguard towers and on roaming patrols that extend from Pismo State Beach to the southern open riding area boundary. Lifeguard towers are installed seasonally around spring break. The towers are built onto a trailer with wheels that is towed onto the beach and erected with the wheels buried. Tower sites are subject to change but are currently near Grand and Pier avenues and the North Beach Campground. Use of UAS for public safety is discussed in section 2.2.5.13.

Rangers, lifeguards, and park aides all must drive across Arroyo Grande Creek and Pismo Creek, when necessary, and are subject to the same crossing restrictions as non-CDPR personnel (section 2.2.5.1 and Appendix B).

2.2.4.2 Emergency Response (CA-33)

CDPR staff responds to medical and law enforcement emergencies, which can occur anywhere within the HCP area and are essential for maintaining human safety. Emergencies exist any time human health or safety is at risk and may require high-speed travel by medical and law enforcement vehicles (e.g., pick-up truck, sport utility vehicle, four-wheel drive ambulance), including in areas without frequent vehicular traffic. Past emergencies have included water rescues, boat strandings, public safety issues, and requests for assistance from adjacent property owners or managers. These and other emergency situations are expected to continue during the permit term. Additionally, although infrequent, CDPR personnel may need to respond to emergencies, such as trespassing, stranded boats, and stranded swimmers, within SNPL and CLTE protected areas (e.g., Exclosures or large single-nest exclosures) during the breeding season. Use of UAS for emergency response is discussed in section 2.2.5.13.

2.2.4.3 Access by Non-CDPR Vehicles (CA-34)

Concessionaires and private companies that provide visitor-related services and require vehicle access are described in sections 2.2.1.1 and 2.2.4.5. On occasion, non-CDPR vehicles require access to the HCP area for various reasons, including enforcing federal, state, county, and municipal laws; conducting search and rescue for lost watercraft in the ocean; conducting marine mammal rescue to remove dead or injured marine mammals; CDFW wardens enforcing California Fish and Game Code regulations for fishing and other resources activities; towing/removing stuck or broken down vehicles at Oceano Dunes SVRA; repairing utility facilities that are on park property; and flying/landing medevac helicopters. These activities may take place throughout the HCP area but primarily occur along the beach and adjacent shoreline. Non-CDPR vehicles generally access areas open to public vehicles, but exceptions include removing vehicles stuck in a closed portion of shoreline, boat salvage, and water rescue. If possible, CDPR will have a USFWS-approved monitor to escort non-CDPR vehicles into otherwise closed areas.

2.2.4.4 ATV Safety Institute Courses (CA-35)

ATV Safety Institute (ASI) certified instructors conduct occasional OHV safety training for ATVs and recreational utility vehicles (RUVs). The training typically consists of a 4-hour day with no more than 20 participants. Training can occur anywhere within the public riding and camping areas of the SVRA, although it has traditionally been offered at the approximately half-acre training area near the Worm Valley vegetation island (Map 3).

2.2.4.5 Beach Concessions (CA-36)

In support of the motorized vehicle recreation occurring at the Oceano Dunes District, various concessionaires have or may be contracted to conduct business on the beach. The OHV rental and tour services stage is located just south of Post 2. The following types of concessionaire-operated services have occurred or currently occur throughout the open riding area. These and similar services are expected to occur during the permit term.

- Mobile recreational vehicle (RV) wastewater pumping and freshwater renewal, which also provides camping-related items
- Professional Humvee tours of the dunes
- OHV rental services (currently four)
- A towing service
- Camper rentals

2.2.4.6 Pismo State Beach Golf Course Operations (CA-37)

The Pismo State Beach Golf Course and restaurant are located within Pismo State Beach (Map 4) and are operated by a concessionaire. The golf course has nine par-3 holes, and golf carts are available to rent. Covered activities in the golf course include regular watering and mowing of lawns, clearing of vegetation around artificial water features, and application of fertilizers and/or herbicides.

2.2.4.7 Grover Beach Lodge and Conference Center (CA-38)

The Grover Beach Lodge and Conference Center has been approved for development on the west end of Grand Avenue within Pismo State Beach (Map 8). The project is a joint effort involving the City of Grover Beach, CDPR, and a private developer. The project comprises 13 acres within the HCP area, including approximately 8 acres for the 150-room lodge and conference center and almost 5 acres of proposed improvements to Pismo State Beach. Construction of the lodge would require relocating existing day use parking, an equestrian staging area, and an RV dump station. The day use parking and equestrian staging area would be accommodated in a mixed-use parking lot in the southeast corner of the Grover Beach Lodge and Conference Center project site. The RV dump station would be relocated to the Grand Avenue parking lot. The final design of the project is still in progress.

2.2.4.8 Natural History and Interpretation Programs (CA-39)

Guided hikes are held in the Oso Flaco Lake area, some of which are led by local non-profits. Most guided hikes are on existing trails. During the school year, the Oceano Dunes District may conduct school field trips at Oso Flaco Lake and at other locations in the HCP area, including the butterfly grove and visitor center. These school field trips typically are attended by 10 to 60 people. In addition, the Dunes Center, a local non-profit, conducts two to three guided field trips per month at Oso Flaco Lake. Typically, the Dune Center field trips accommodate 5 to 30 people. The Oceano Dunes District staff conducts stationary and “roving” interpretation in the Oso Flaco Lake area more frequently, especially in the summer. Roving interpretation may include setting up a table with items of interest, such as animal specimens, and inviting the public to learn about the displays. Interpretive walks are also provided in the HCP area. Oceano Dunes District staff also have two interpretive trailers that can be towed onto the beach or elsewhere and are utilized for programs or more impromptu outreach.

2.2.5 Other HCP Covered Activities

2.2.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

CDPR vehicles drive across the portion of Pismo Creek that flows out to the ocean in order to conduct regular ranger and lifeguard patrols along the beach and at North Beach Campground. At times, visitor services and maintenance personnel will also cross the confluence of Pismo/Carpenter Creek to get to the North Beach campground. Although CDPR vehicles could travel on surface streets, this has become standard practice for expediency, especially during urgent situations (e.g., emergencies), since leaving the beach for surface streets would require the lifeguards/rangers to travel farther and air up their tires, thus increasing response times. CDPR vehicles also cross Oso Flaco Creek closest to the shore when accessing South Oso Flaco. Visitor vehicles are not allowed in this area.

No camping or OHV use is permitted near Arroyo Grande Creek since it is outside of the open riding area, but the creek is crossed by motorized vehicles at its mouth when it is flowing into the ocean. The Oceano Dunes District has established via Superintendent's Order specific guidelines governing closure of the creek to vehicular crossings to protect human life, prevent loss of property, and protect the waterway from pollution potentially caused by prolonged submersion of vehicles (section 1.5.7).

Arroyo Grande Creek can only be crossed using street-legal vehicles. Pursuant to a Superintendent's Order (section 1.5.7), street-legal vehicles are prohibited from crossing Arroyo Grande Creek in any manner other than by crossing the creek as close to the ocean waterline as possible and parallel to the ocean waterline. Driving upstream or downstream in the creek channel or in any other manner in the creek channel is prohibited. In addition, if the creek crossing has a "closed" sign or water depth exceeds 12 inches as measured closest to the water line, crossing the creek is prohibited. The Oceano Dunes District informs visitors of these creek-crossing rules via outreach both in and out of the park, including through active contact with visitors. Because visitors can still access the beach from Grand Avenue and Pier Avenue and drive on the beach when it rains and the creek becomes a challenge to cross, rangers specifically patrol the crossing area to keep visitors from crossing. The Grand Avenue and Pier Avenue entrances remain open even when the c reek crossing is closed because the public is still allowed on the beach north of Arroyo Grande Creek. Arroyo Grande Creek is assessed daily during storm, wave, and high tide events and creek crossing by vehicles may close when on-duty State Park Peace Officers (SPPO's) determine it is too dangerous to cross. CDPR may also close the park to camping if sustained storms or tidal conditions will result in extended creek crossing closures.

2.2.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

Pismo Village RV Resort is a private campground that abuts the Pismo State Beach boundary and Pismo Creek estuary (Map 3). Visitors camping in the resort access the Pismo State Beach by following a volunteer path that has formed on CDPR property along the southeast bank of Pismo Creek. The Oceano Dunes District has proposed installing a seasonal, floating pedestrian bridge across Pismo Creek estuary to provide pedestrian access from the Pismo Coast RV Resort to Pismo State Beach (Map 8). Should the Oceano Dunes District obtain the permits and materials necessary to install the bridge, it will be included as a covered activity under this HCP.

The floating bridge will be an 8-foot wide, pontoon-style bridge with interlocking modules, handrails, and abutments. The abutments will be supported using two helical anchors at each abutment. The bridge will be installed in the spring after flows no longer threaten to undermine the abutments or wash out the bridge. Once installed, the bridge will be removed during any event that could threaten to undermine the abutments or wash out the bridge. The determination to remove the bridge in the fall, prior to the rainy season/winter, will be based on current field conditions and anticipated rainfall or

wave duration, frequency, and intensity. Installing the bridge should reduce the pedestrian impact on Pismo Creek by reducing erosion and providing an alternative to walking through the mouth of the creek for pedestrians wishing to walk up the coast.

The bridge, abutments, and anchors will be installed and removed each year by a licensed contractor employing hand crews and/or a small excavator. Installation and removal will last 2 to 3 days at each instance (4 to 6 days per year). The bridge will be stored offsite when not in use and will be transported to and from the beach by truck.

2.2.5.3 Limited Trail Riding Area (CA-42)

Starting in the 1980s, CDPR planted native vegetation (non-listed species) in an approximately 28-acre dune area that was deemed vulnerable to movement into Oso Flaco Lake.[25] The area that was vegetated is currently closed to motorized recreation (Map 8). In order to retain the potential for motorized vehicle recreation opportunity in this area, the project was broken into phases. The first phase, vegetating the sand sheets to control sand movement, was completed. The next phase, installing a trail system through the area, would restore motorized vehicle recreation opportunity in the area while reducing the potential for sand movement into Oso Flaco Lake. The trail has not been built and is currently only in a conceptual stage, but it may be developed during the permit term. Trail construction would require clearing vegetation and maintaining the cleared alignment. For purposes of HCP analysis and ITP coverage, it is assumed the project would comprise less than 2 miles of trail with a trail width of 20 to 30 feet. The overall trail footprint is estimated to be less than 7 acres. The trail may be a "dead end" with a turnaround area, a loop, or a through passageway between the Boneyard and Maidenform Flats areas. The trail may include basic amenities such as a picnic table or interpretive features. Segments of the trail that include a turnaround or amenities would be wider than the rest of the alignment. For example, a turnaround could be approximately 30 feet in diameter to safely accommodate vehicles. CDPR would monitor the trail to check for vehicles leaving the trail and trespassing onto vegetation. In addition to frequent patrols, signage and fencing would be used as needed to prevent trespass. Additionally, the trail entrance(s) would be gated so that the trail could be closed if needed, although it is assumed that the trail would typically be open year-round on a 24-hour basis.

2.2.5.4 Replacement of the Safety and Education Center (CA-43)

An informational kiosk area referred to as the Safety and Education Center exists on the dunes just south of Pavilion Hill (Map 3). This facility needs routine maintenance (e.g., signs cleaned and painted). In addition, signs and associated structures need to be removed and replaced every 5 to 10 years. Depending on operational need, this Safety and Education Center may be relocated to other areas within the HCP covered lands.

2.2.5.5 Dust Control Activities (CA-44)

DPR implements a Dust Control Program to comply with the Stipulated Order of Abatement (SOA) approved by the SLOAPCD Hearing Board in April 2018 (Case No. 17-01) and amended in November 2019, October 2022, and October 2024. The intent of this program is to control dust and particulate matter (PM) emissions and improve air quality downwind of Oceano Dunes SVRA. The SOA, as amended, requires CDPR to prepare and submit an Annual Report and Work Plan (ARWP) to the SOA Scientific

[25] The area that was vegetated was previously referred to as the "40 Acres" site.

Advisory Group (SAG) and the SLOAPCD for review and approval that identifies the dust control activities necessary to comply with the SOA's requirements.[26]

Two important requirements of the original 2018 SOA and the first amendment to the SOA, adopted in November 2019, were: 1) A 50% reduction in 24-hour PM_{10} mass emissions from Oceano Dunes SVRA (as compared to modeled 2013 baseline conditions), and 2) Achievement of the state and federal 24-hour PM_{10} ambient air quality standard at SLOAPCD air quality monitoring stations located downwind of the ODSVRA. The second amendment to the SOA, adopted in October 2022, substantially modified the key requirements of the original 2018 SOA and the 2019 amendments to the SOA. Specifically, the October 2022 SOA amendments replaced the requirement to reduce baseline PM_{10} emissions by 50% and achieve absolute ambient air quality standards with a new requirement that is "designed to eliminate emissions in excess of naturally occurring emissions from the ODSVRA that contribute to downwind violations of the state and federal PM10 air quality standards." The October 2024 SOA amendments extended the SOA through December 1, 2028, so that CDPR and SLOAPCD can continue to collect data, refine the air quality model used to evaluate compliance with the SOA, and confirm ODSVRA is not in a condition of excess emissions.

As required by the SOA, CDPR has prepared an ARWP each year since 2019. CDPR's most recent ARWP is the 2024 ARWP, which was approved by the SLOAPCD on October 15, 2024. As of April 2025, the status of the Oceano Dunes SVRA Dust Control Program is as follows:

- *Native vegetation planting:* CDPR has planted approximately 352 acres of native, non-foredune vegetation throughout Oceano Dunes SVRA for dust control purposes.[27] CDPR's Dust Control Program vegetation plantings are in addition to vegetation planted for habitat restoration purposes (see section 2.2.2.2); however, the methods for planting vegetation are generally the same regardless of whether the vegetation is planted primarily for dust control or habitat restoration purposes (refer to section 2.2.2.2). Planted areas are bounded by multi-strand fence with variable size openings. Wooden peeler poles are spaced approximately every 100 feet along the fencing, with T-posts spaced every 10 to 15 feet.
- *Foredune restoration:* CDPR has implemented a 48-acre foredune restoration project north of Post 6 (Map 8). This restoration effort is based on a SAG design in which the 48-acre restoration project is subdivided into six different areas, each with a different treatment method. Fencing is as described above for other vegetation planting. The fencing allows for vehicle travel pathways, referred to as alleyways, through the foredune area between the shoreline and the open riding area to the east. These alleyways are closed to camping to maintain vehicle circulation. The foredune boundaries also exclude vault toilets to ensure access to those facilities remains. The 48-acre foredune installation resulted in a narrow beach area to the west of the foredune project and narrow alleyways in between different foredune restoration treatments, as well as a small corridor to the south of the foredune, between the foredune project and the 6 Exclosure. If a SNPL or CLTE nest is established within the foredune area, single-nest exclosures are implemented as necessary (section 5.3). Fencing is removed and the area is opened to the public once all nests have hatched and chicks have fledged from the foredune areas and shoreline.

[26] Pursuant to SOA 17-01, as amended, the role of the SAG is to evaluate, assess, and provide recommendations on the mitigation of windblown PM emissions from Oceano Dunes SVRA and on the development of CDPR's ARWP, while the SLOAPCD has ultimate review and approval authority for CDPR's ARWP.

[27] Approximately 276 acres of vegetation has been planted inside the Oceano Dunes SVRA open riding and camping area, while approximately 76 acres have been planted outside the open riding and camping area.

- *Seasonal and/or temporary dust control measures:* CDPR has, since 2011, installed seasonal and/or temporary dust control measures necessary to meet Dust Control Program priorities and objectives. The program's temporary and seasonal measures have primarily included wind fencing and straw treatments, with other types of dust control measures being less common.[28,29] In general, wind fencing and straw treatment areas have eventually been replaced with native dune vegetation. As of April 2025, all straw treatments previously in place at Oceano Dunes SVRA have been converted to native vegetation.
- *Supplemental vegetation plantings and maintenance of seasonal and/or temporary non-foredune dust control measures:* CDPR, as necessary, conducts supplemental planting and seeding in non-foredune vegetation planting areas and maintenance activities in seasonal and/or temporary dust control measures. Supplemental planting and seeding activities often focus on the west-facing portions of vegetation installations where direct wind and sand activity bury or undermine treatments. Some supplemental planting and seeding areas require straw, while others do not. Maintenance activities in temporary dust control areas generally include repositioning or augmenting deteriorated materials to maintain dust control effectiveness.
- *Meteorological and PM monitoring:* CDPR has regularly installed seasonal and temporary meteorological and PM monitoring sites at Oceano Dunes SVRA for more than 15 years. CDPR's meteorological and PM monitoring network varies slightly from year to year depending on specific goals, objectives, and dust control measures, but generally has up to 15 meteorological and PM monitoring sites located throughout and downwind of Oceano Dunes SVRA and, more recently, 6 meteorological and PM monitoring sites in the 48-acre foredune. In general, each monitoring site includes a suite of instruments affixed to a tripod, platform, or tower located 3.5 to 10 meters above ground level that collect wind speed and wind, ambient temperature, relative humidity, and barometric pressure. To reduce avian predators using these towers as roosting sites, CDPR installs Nixalite (bird spikes), when necessary, to reduce perching potential and the potential for a bird to interfere with instrumentation. The total land area occupied by CDPR's monitoring activities is typically no more than 3 acres.
- *Track-out control:* In November 2022, CDPR completed the installation of V-shaped, grooved concrete panels west of the entrance kiosks at Grand Avenue. The concrete panels are 45 feet wide and approximately 75 feet in length and extend down the Grand Avenue entrance sand ramps. CDPR continues to use temporary rubber track-out mats installed in 2019 at the Pier Avenue entrance. The temporary mats are regularly cleaned when the beach is open to public vehicle activity. CDPR also continues to conduct ongoing street sweeping activities on Pier and Grand Avenues at a minimum of three times per week.

The Oceano Dunes SVRA Dust Control Program is an ongoing, adaptive management program that has made substantial progress towards improving air quality conditions downwind of the SVRA. Future Dust Control Program activities will be refined as part of the ARWP process established by the SOA; however,

[28] A seasonal activity (e.g., dust control measure, monitoring activity) occurs for a defined period, usually between March 1 and October 31 of each calendar year. In contrast, a temporary activity occurs indefinitely, but not permanently.

[29] Seasonal and temporary dust control measures generally include wind fencing, straw bales and other broadcast surficial straw treatments, porous roughness elements, and other materials that can sometimes, but not always, be recovered and reused in subsequent dust control projects. CDPR has also excluded vehicles from areas (vehicle exclusion areas) and has explored, in a very limited manner in 2014, the use of soil stabilizers as a form of seasonal and/or temporary dust control at Oceano Dunes SVRA.

CDPR anticipates that certain annual activities, such as supplemental vegetation plantings and meteorological monitoring, will continue into the future. In addition, due to the SOA and the adaptive nature of the Dust Control Program, CDPR may need to plant new vegetation or install new temporary and/or seasonal dust control measures to achieve program objectives. Thus, for the purposes of this HCP, Dust Control Program covered activities include:

- *Continued implementation of annual Dust Control Program activities:* CDPR will continue to implement the activities described above:
    - Supplemental vegetation plantings
    - Maintenance of seasonal and/or temporary dust control measures
    - Meteorological and PM monitoring
- *Supplemental foredune planting.* Supplemental planting has not been conducted in the 48-acre foredune restoration project because the initial restoration effort is still undergoing scientific evaluation, but such plantings could occur in the future.
- *New non-foredune vegetation plantings and seasonal and/or temporary dust control measures*: CDPR may need to plant additional vegetation in backdune areas of the SVRA and/or install additional seasonal and/or temporary dust control measures to meet SOA requirements; however, the location and number of acres of potential vegetation plantings and seasonal and/or temporary dust control measures is not specifically known at this time. The need for such activities, if any, will be determined during the development of each subsequent ARWP.
- *Preservation of foredune vegetation in the Southern Exclosure:* Some areas of foredune vegetation in the Southern Exclosure may be protected temporarily or permanently to meet the SOA. This measure could involve fencing or otherwise protecting some areas of foredune vegetation that has established in the Southern Exclosure.
- *New track-out control*: CDPR may replace the temporary rubber track-out mats at the Pier Avenue entrance with a permanent system in the future similar to that installed at the Grand Avenue entrance.

2.2.5.6 Cultural Resources Management (CA-45)

Cultural resource management actions in the HCP area include, but are not limited to, the following: archeological testing and/or data recovery mitigation, archaeological survey and inventory, archaeological site monitoring, evaluation of cultural resources according to the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) criteria, erosion control and stabilization of archaeological sites, control of invasive plant species, revegetation of archaeological sites, cultural landscape inventory, historic landscape maintenance, and formulating and implementing protection, preservation, and interpretive standards for eligible resources. OHMVR Division archaeologists work with staff environmental specialists to ensure that cultural resource projects avoid or minimize impacts to sensitive natural resources. Environmental monitors often accompany archaeologists in the field when cultural resources protection work will be occurring within or adjacent to sensitive habitat.

2.2.5.7 CDPR Management of Agricultural Lands (CA-46)

The Oceano Dunes District leases one parcel comprising approximately 115 acres of land east of Oso Flaco Lake to an agricultural operator (Map 3). These lands have been actively farmed for more than 30 years. Agricultural operations, including tilling, planting, harvesting, and pesticide use, are not covered activities. However, two ditches that flow from the agricultural lands drain into Oso Flaco Lake (Map 7).

Ditch maintenance consisting of sediment or vegetation removal is a covered activity that may be required sometime in the next 25 years.

2.2.5.8 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

A bioreactor was installed on the southern agricultural parcel to improve water quality of runoff from the agricultural lands upstream of the Oso Flaco area (Map 7). Denitrifying bioreactors are a technology currently undergoing research and development to reduce nitrate and pesticide concentrations in runoff water. Nitrate is removed from the water and converted to nitrogen gas by denitrifying bacteria living in the anoxic woodchip bioreactor that use the wood as a carbon source. The Coastal San Luis Resource Conservation District (CSLRCD) has constructed a woodchip bioreactor lined with 10 millimeter (mm) heavy-duty agricultural liner and fed by water from Little Oso Flaco Lake. Source water is pumped to the bioreactor from several hundred yards away through a polyvinyl chloride (PVC) pipe and is distributed over about half the length of the bioreactor through a gated irrigation pipe. After filling, the bioreactor gravity-drains over a period of several hours back into Little Oso Flaco Lake, then refills again.

Bioreactor construction was completed October 30, 2014, and was monitored for the water volume treated, nitrate concentration reduction, and nitrate load reduction. A total of 360,000 gallons of irrigated runoff water were treated and the average concentration of nitrate was reduced by 12 parts per million (ppm) (with an average inflow of 20 ppm and average outflow of 8 ppm), and 36 pounds of nitrate as nitrogen was removed (Wagner 2015). Preliminary data shows that the bioreactor is efficient for nitrate removal. However, pesticide-removal efficiency has not been monitored and evaluated. The Surface Water Protection Program described in section 2.2.2.5 includes water quality monitoring for pesticides.

Bioreactors require little to no maintenance. The covered activity includes maintenance of the bioreactor itself, maintenance of the pump, and maintenance of the water inlet and outlet.

2.2.5.9 Oso Flaco Lake Boardwalk Replacement (CA-48)

The boardwalk that extends over Oso Flaco Lake will likely need to be replaced at least once during the permit term. This segment of the boardwalk spans approximately 940 linear feet of aquatic habitat (wetlands and open water), comprising approximately 6,757 square feet. Compared to replacement of upland boardwalk segments in Oso Flaco (CA-31 section 2.2.3.12), replacing all or significant sections of the boardwalk spanning aquatic habitat would involve more complex logistics. For example, wooden and/or plastic pilings supporting the structure would need to be removed, with replacement piers potentially installed via a pile driver. Equipment and materials may traverse wetlands or need to be ferried to the worksite via a boat or floating platform. Additionally, the replacement boardwalk would need to comply with current code and, thus, may need to be modified in size, location, or other design considerations that could affect its footprint within aquatic habitat. Construction details are not available at this time but would be developed as part of the budgetary and planning process. It is assumed the boardwalk would be designed to avoid the loss of aquatic habitat, as feasible, and any change in the boardwalk layout would affect no more than 1.5 acres of aquatic habitat. Measures will be developed to address possible impacts to covered species, jurisdictional waters, water quality, migratory birds, and other resources in the area.

2.2.5.10 Special Projects (CA-49)

Special projects considered under CA-49 are activities that are not yet proposed, and are thus not described under other covered activities, but that may occur over the permit duration. Special projects are those activities that are not considered routine but are required to meet facility and/or operational needs (e.g., installing vault toilets, rerouting trails, etc.) and that could have an impact on a covered

species or its habitat. Only special projects that incorporate AMMs are covered under the HCP. Such projects fall into two categories:

- Replacement/expansion of existing facilities in the existing facility footprint
- New facilities that are consistent with existing facilities, not to exceed 35 acres over the permit term

Special projects covered by this HCP could occur near but not within vegetation islands and do not include those that occur in aquatic habitat. Special projects in aquatic habitat would be subject to a separate regulatory evaluation. CDPR will notify and confer with USFWS prior to construction of proposed special projects that could impact covered species despite implementation of AMMs. A more detailed explanation of the approval process for special projects is provided in Section 6.4.2.

2.2.5.11 Reduction of the Boneyard and 6 Exclosures (CA-50)

The OHMVR Division plans to open additional area for recreation during the SNPL and CLTE breeding season. To provide additional opportunity for year-round recreation, the OHMVR Division proposes to no longer fence off the East Boneyard Exclosure (approximately 44 to 49 acres depending on dune topography) starting with the first breeding season under the HCP, if opening the area is consistent with the requirements of other programs. Based on these other operational or regulatory considerations, all or a portion of this area may be closed temporarily or permanently during the non-breeding season. The eastern fenceline of East Boneyard is not maintained as a predator fence due to the rapidly shifting open sand dunes in the area that make it difficult to maintain. Although the Boneyard Exclosure once played a more significant role in CLTE and SNPL nesting, it no longer receives the number of nests it did prior to 2005. In fact, CLTE have not nested in the East Boneyard Exclosure at all since 2005, and only 11 SNPL nests have been established in the East Boneyard Exclosure during this time. The Boneyard Exclosure area is located in an extremely active part of the dunes; thus, there is no set location for the current interior boneyard fence. It is installed annually in a location that best allows necessary maintenance. CDPR may need to adjust the location of the fence each year. The area opened up for East Boneyard may fluctuate up to 5 acres based on field conditions.

Currently, visitation by park users in South Oso Flaco is infrequent during the breeding season because there is no public access via the open riding area. When East Boneyard is no longer closed off during the breeding season, the Oso Flaco fence at the south end of East Boneyard would be moved, as necessary, to ensure that recreational access to South Oso Flaco from the former East Boneyard Exclosure would be limited. In addition, because SNPL and/or CLTE may still use West Boneyard to nest and could be disrupted by vehicles that travel in the former East Boneyard area, fencing would be erected in the East Boneyard area, as needed, to ensure that appropriate buffers from any nests are maintained.

The Southern Exclosure was initially extended north to Post 6 in July 2003 as a result of a consent decree that CDPR entered into with a local Sierra Club chapter in 2005.[30] Specific to the HCP process, the consent decree stipulated that CDPR "shall support a northern [seasonal exclosure] boundary of Distance Marker Number 7, notwithstanding the terms of this consent decree." This stipulation memorialized CDPR's commitment to providing recreational opportunities in the area if compatible with natural and cultural resources conservation, specifically the conservation of SNPL and CLTE. Thus, if specific criteria are met, CDPR may approve the incremental reduction of the 6 Exclosure, and the

[30] Although the consent decree was not finalized until 2005, it included implementation of exclosure boundary adjustments in 2003. The initial extension, in 2003, was narrower than the current configuration, which began in 2004.

approximately 62-acre exclosure may ultimately no longer be fenced. However, the incremental reduction of the 6 Exclosure will only be considered if it is consistent with compliance of other regulatory programs in the HCP area.

If CDPR determines that reductions are supported by the appropriate considerations, including consistency with other programs, the 6 Exclosure may be reduced in approximately 328-foot (100-meter) increments from north to south, or CDPR may implement alternative incremental reductions—such as by adjusting the eastern fence—to better suit SNPL and CLTE management. CDPR will work with the USFWS and the appropriate stakeholders to develop a 6 Exclosure reduction that achieves additional riding area while protecting nesting shorebirds (see section 5.2.3 for a more detailed explanation of the criteria for reducing the exclosed area). If the criteria are not met for either species, the 6 Exclosure will be restored to its original extent in the following breeding season in coordination with the USFWS. Any decisions to restore the 6 Exclosure fence to ensure the criteria are met will be based on the best available science and could include additional management actions (e.g., predator management) in addition to restoring the fence size.

2.2.5.12 Use of Pesticides (CA-51)

CDPR has determined the need to use vector control and terrestrial and aquatic herbicides (together "pesticides") to control invasive species and encourage re-establishment of native dune and wetland vegetation. Oceano Dunes District staff use pesticides in the HCP area to manage habitat (section 2.2.2.2), control invasive plants (section 2.2.2.3), maintain facilities (section 2.2.3.2), and for other ecosystem management purposes (sections 2.2.3.7 and 2.2.4.6). The Oceano Dunes District has used pesticides for over 15 years and has devoted approximately $100,000 each year to controlling invasive species in the HCP area. Independent contractors are hired to apply herbicides for invasive species control, and the local vector management district is contracted to apply insecticides for mosquito control. Most herbicides are applied via backpack and vehicle-mounted sprayers; however, additional methods may be used as they are approved. Insecticides used for mosquito control are applied using helicopters. In addition, CDPR started using a helicopter equipped with a spray boom for the application of herbicides to control veldt grass in spring of 2019 in Phillips 66 Leasehold and Coreopsis Hill. Aerial application allows a large area to be sprayed in a short amount of time (e.g., 90 acres in about 2.5 hours for veldt grass control), allowing for efficient coverage. Aerial spraying for veldt grass can be conducted during the SNPL and CLTE breeding season but is conducted well away from nesting areas. In addition, aerial spraying activities include a 300-foot minimum buffer from wetlands with standing water.

All pesticides are stored, applied, and disposed of in accordance with label instructions and in compliance with state and local laws.

The Oceano Dunes District is currently developing an Aquatic Pesticide Application Plan (APAP) for the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for the Residual Aquatic Pesticide Discharges to Waters of the U.S. from Algae and Aquatic Weed Control Applications. CDPR intends to control infestations of invasive plant species, including, but not limited to, Russian wheat grass (*Elytrigia juncea* ssp. *boreali-atlantica*), European beachgrass, and giant reed (*Arundo donax*), present along riparian corridors, lagoons, and wetlands in the HCP area.

Targeted treatment of invasive species by CDPR staff and contractors is determined by the implementation of an Integrated Pest Management (IPM) program. One of the primary operational goals of the IPM program is to establish a general and reasonable set of control measures that not only aid in managing invasive species populations, but also address public health and safety, economic, beneficial use, legal, and aesthetic requirements. Setting an action threshold is a critical step in guiding pest control management decisions and determining the scope of IPM program implementation. An action threshold level is the point at which action should be taken to control invasive species before a

water body or native plant community is significantly impacted; however, established action threshold levels may change based on public expectations. A central feature of IPM is to determine when control action is necessary, determine the best preventive measures, and limit the unnecessary use of pesticides. Other adverse impacts to native plant ecosystem functions that could trigger an action include overcrowding and out-competing native species; topographical alterations with foredune build-up that impede the flow of fog drip to backdune areas; or reducing recreational access. If invasive species conditions exceed a threshold, a control method is often implemented. Control methods can include mechanical (i.e., by hand, weed whips, mowing, or excavators), cultural (i.e., modifying the timing of pesticide and non-pesticide controls to reduce the amount of pesticides used), biological, and/or chemical control, consistent with CDPR's IPM techniques.

The selection of and decision to use a pesticide is based on the recommendation of a California Department of Pesticide Regulation (DPR) licensed Pest Control Adviser (PCA). The PCA considers a variety of control options that may include mechanical removal and/or cultural methods, which are the most efficacious and protective of the environment. Evaluating alternative control techniques is part of CDPR's IPM approach; therefore, an alternative treatment may be selected as part of a test program. Alternative control techniques include mechanical removal and/or native species establishment. In general, alternative control techniques may be more expensive, labor intensive, and not as effective as chemical control. In addition, alternative control techniques could cause temporary water quality degradation and/or the further spread of weeds.

Chemical control may be employed as a control method and is considered a critical part of the IPM program. For some weed varieties, herbicide application may be the most effective method of control (i.e., longest lasting or least labor-intensive); for highly aggressive invasive species, this may be the only control method available. Herbicide application may also be implemented as a preventive measure prior to threshold exceedance. For example, weeds may reasonably be predicted to cause future problems based on predicted growth rate and density, historical trends, weather patterns, water flow, and habitat management experience. Managing invasive plant populations before they reach reproductive maturity is a crucial step in a comprehensive and effective weed control program. Early treatment of weed incursions reduces the total amount of herbicide needed because there is less plant mass to target. Furthermore, treating weeds within the ideal time frame of their growth cycles ensures that the selected control measures will be most effective. When using herbicides, the product label provides information for how and where the herbicide may be used. This includes methods of applying herbicides, the type of plant it will effectively treat, and the timing of herbicide applications.

Pesticides currently used in the HCP area include the following:[31]

- Glyphosate (Roundup)
- Imazapyr
- Fluazifop p butyl (Fusilade)
- Triclopyr (Garlon)
- Aminocyclopyrachlor (Perspective)

[31] Additional pesticides may be used in the HCP area as new products become available, especially if research indicates they can be more effective at controlling invasive species on site. All new pesticides and application methods will be used in accordance with label instructions and in compliance with state and local laws.

- Chlorsulfuron (Perspective)
- Aminopyralid (Milestone)
- Clethodim (Vaquero)
- Sethoxydim (Poast)
- VectoBac G
- Crosshair
- Surfactants

Three main herbicides are used throughout the HCP area as part of IPM program implementation, including glyphosate (Roundup), imazapyr, and fluazifop-P-butyl (Fusilade). Triclopyr (Garlon), aminocyclopyrachlor + chlorsulfuron (Perspective), and aminopyralid (Milestone) are used infrequently in the HCP area. Specifically, Aminocyclopyrachlor + chlorsulfuron is used on iceplant populations that are resistant to glyphosate, aminopyralid is used on Cape ivy, and Triclopyr is mixed with glyphosate to treat populations of Cape ivy. Round Up Custom® is a glyphosate formulation that is approved for use in aquatic systems and will be part of CDPR's management of invasive weeds below the high-water mark when the APAP is approved. Clethodim and/or sethoxydim are used in aerial application to control veldt grass. Herbicides may be combined as needed. In addition to the herbicides, surfactants and crosshair are usually added to herbicide spray solutions for efficacy. CDPR also uses the insecticide VectoBac G for mosquito control.

CDPR does not apply herbicides during periods of rain or when substantial rain (0.5 inches or greater) is forecast within the next 48 hours. This is essential to maximize the effectiveness of the herbicide application and to reduce the potential for washing the herbicide to non-target plants or having herbicide enter waterways. Herbicide labels also specify restrictions on applying products during wet or rainy periods.

A detailed description of these pesticides, their toxicity, and use in the HCP area is included in Appendix H. Every 2 years CDPR creates new contracts for invasive species removal to continue the control of past sites and include new sites to spray. AMMs to minimize the impacts of pesticides on covered species are included in Chapter 5.

2.2.5.13 CDPR UAS Use for Park Activities (CA-52)

CDPR may use UAS in the HCP area to reduce the time and cost associated with data collection, especially in more remote areas. All UAS operations will be consistent with CDPR policies regarding UAS use. While the immediate use for UAS has been to assess habitat for habitat enhancement activities (section 2.2.2.1.2), CDPR may use UAS for other activities as staff experience and accessibility increase (CDPR 2024b). Activities for which UAS may be used include, but are not limited to, SNPL and CLTE monitoring (section 2.2.2.1.2), especially in areas that are difficult to access; predator management, including tracking (section 2.2.2.1.2); assessment of seasonal exclosure fencing (section 2.2.2.1.1); assessment of air quality projects (section 2.2.5.5); watershed assessments, including water flow, temperature, and turbidity (section 2.2.2.5); WHPP, including documenting vegetation, invasive species, and other natural resources (section 2.2.2.4); restoration planning, including documenting changes in vegetation (section 2.2.2.2); and public safety management and response (sections 2.2.4.1 and 2.2.4.2).

Currently, CDPR does not have authorization to fly UAS during the nesting season and over known nesting areas. As part of this HCP, CDPR would include limited flights over active nesting areas as needed to meet the monitoring or management objectives. CDPR would implement all UAS activity in a way that minimizes impacts to nesting or roosting SNPL and CLTE. The 2021 BMP places limits on use of UAS

during the nesting season; however, the BMP is an interim step until the completion of a NCCP. This HCP covers activities by CDPR throughout the permit term during both the nesting and non-nesting periods and over occupied areas (nesting and roosting areas).

The CDPR-approved Oceano Dunes District Small Unmanned Aircraft Systems Operations Manual (CDPR 2024b) expands the use of drones/UAS into other programs, emphasizing use in law enforcement and public safety for responding to and supporting exigent and emergency incidents. Potential uses include, but are not limited to: search and rescue; training; monitoring special events, film shoots, civil unrest, or other similar situations; assisting in safeguarding public and officer safety; monitoring soft targets, counter protesters, criminal actors within a peaceful assembly, and providing enhanced public safety and resource protection through active monitoring; providing investigative support and response to specific incidents such as tactical situations with SWAT, regional task forces, Homeland Security, hostage/barricade situations, collision reconstruction, active shooters, officer involved incidents, and crime scene evidence documentation.

Typically, law enforcement and public safety UAS work occurs away from known CLTE and SNPL nesting and roosting areas, which are closed to visitor use. However, there may be times when UAS may be needed for water-based rescues adjacent to active nesting areas, or suspects enter closed areas. All CDPR UAS operators will have received training in the safe operation of UAS in the vicinity of SNPL and CLTE. Training for avoiding take-offs and landings near sensitive wildlife areas and CLTE mobbing behavior is required. Although emergency operations cannot be planned or worked around nesting requirements, AMMs will minimize the risk to SNPL and CLTE from such operations. Law enforcement UAS training will include advanced training to minimize impacts during emergency response. UAS operations under emergency conditions will follow all AMMs to the maximum extent practical, and a visual observer will always be present to aid in watching for other aircraft and birds.

2.2.6 Activities Not Covered by Permit

- Unlawful actions of visitors not following park regulations (e.g., dogs off leash or entering prohibited areas)[32]
- Impacts to covered species in the HCP area from off-site activities outside the control of CDPR (e.g., agricultural runoff)
- Agricultural operations on CDPR-owned lands, including non-CDPR application of pesticides (e.g., herbicides, insecticides, and rodenticides) for agricultural uses
- Actions of non-CDPR personnel (e.g., Phillips 66, utility companies, local agencies, other state agencies, federal agencies) in the HCP area but outside the control of CDPR personnel (e.g., no prior notification, no ability of CDPR to advise as to closures or other avoidance/minimization measures)
- Any major development projects (e.g., new campgrounds, roads, or new building construction) not described in this HCP

[32] Unlawful activities will occur in the HCP area and are discussed in the HCP. The AMMs in section 5.3 include measures CDPR implements to minimize these unlawful activities.

2.2.7 Public Works Plan

In 2020, CDPR published a Draft Pismo State Beach and Oceano Dunes SVRA PWP, which is a long-range land use and development plan pursuant to the California Coastal Act and California Public Resources Code. The PWP would cover operations and development within the Oceano Dunes District, replacing CDP 4-82-300. The PWP process is presently on hold, and CDPR has no current plans to move the draft PWP forward. In the future, CDPR may evaluate and propose some of the specific projects previously scoped in the PWP, such as:

- Facility improvements at the parks' corporation yard
- Oceano Campground infrastructure improvements
- North Beach Campground facility improvements
- Changes at the Grand Avenue and Pier Avenue entrance areas, including lifeguard tower and kiosk improvements and assessing changes to use of those entrances
- Adding visitor-serving amenities at the butterfly grove
- Developing an accessible public access boardwalk along foredunes between Grand and Pier avenues
- Operational changes that could alter the areas that are open to OHV recreation within the covered areas
- Limited trail riding area

As individual projects are brought forward for implementation, they will be assessed for incorporation into the HCP via amendment. Some of the smaller PWP projects could possibly be incorporated into the HCP as special projects (CA-49; section 2.2.5.10) and not require an amendment. The limited trail riding area is already included as a covered activity (CA-42; section 2.2.5.3).

This page intentionally left blank

Chapter 3. Environmental Setting/Biological Resources

This chapter focuses on the natural history of each of the covered species, including status, distribution, and habitat characteristics, along with literature sources. Specific information is provided regarding the occurrence of the species within the HCP area, along with the regulatory setting and listing status for each species. Chapter 3 also describes the overall setting of the HCP area and summarizes the data and data sources used for the analysis of the covered species, including data on vegetation communities, species occurrences, water features and drainages, topography, soils, and imagery.

3.1 Environmental Setting

3.1.1 Climate

The HCP area has a Mediterranean climate characterized by year-round mild temperatures of little diurnal fluctuation, moist winters, and warm dry summers. A band of low clouds often occurs along the immediate coast during the summer months. This cloudy zone moves inland during the night and early morning hours and recedes offshore during the day. As a result of the influence of the Pacific Ocean, temperatures along the coast remain moderate year-round. Average maximum temperatures in the summer are typically in the 60s and 70s; average minimum temperatures in winter are typically in the 40s and 50s. Local precipitation data can be retrieved from a weather station installed in Nipomo by the California Irrigation Management Information System (CIMIS). The 2013–2015 data reflect the recent drought suffered by all of California. Annual precipitation in 2013 was 7.1 inches, 14.1 inches in 2014 (CIMIS 2014), 8.3 inches in 2015 (CIMIS 2015), 14.3 inches in 2016 (CIMIS 2016), 15.5 inches in 2017 (CIMIS 2017), and 11.6 inches in 2018 (CIMIS 2018).

Along the coast of California, wind predominately blows from the west and northwest. These prevailing wind patterns are most pronounced during the spring (March to June). During this period, hourly average wind speeds often exceed 20 mph or more in the HCP area from approximately mid-morning to late afternoon, with little to no variation in the prevailing wind direction. The winds become light and variable at night and in the early morning hours.

3.1.2 Topography/Geology

The HCP area is located within the Coast Range geomorphic province of California, at the intersection of the Pacific and North American tectonic plates. The province is typified by northwest-trending mountain ranges and valleys, almost parallel to the San Andreas Fault, which is located about 40 miles east of the HCP area. Most of San Luis Obispo County sits atop a 180-million-year-old mix of consolidated igneous, metamorphic, and sedimentary rock.

The HCP area is located at a low elevation, ranging from about 0 to 192 feet above mean sea level (USGS National Elevation Dataset, 1/3 arcsecond DEM, accessed on June 4, 2013). The shoreline is composed of flat, broad beaches, and it undulates through the dunes that are located to the east. Lake, creek, and wetland areas within or adjacent to the dunes are generally flat.

The HCP area is dominated by sand dunes; thus, beach sand is the dominant soil in the HCP area, much of which is barren of vegetation. Soil permeability is high and rapid, and wind- and wave-action erosion is high. The dune sands originate from rivers and streams and are deposited by ocean currents onto the beach, where they are shaped by prevailing ocean winds. Dune crests run north to south. On the western, windward side, dune slopes are gentle. On the eastern, leeward side of the dunes, slopes are steep. Wave action, wind, and water erosion cause dunes to move slowly over time.

3.1.3 Hydrology/Streams, Rivers, Drainages

Two major watersheds comprise the HCP area, including the Arroyo Grande Creek watershed in the northern portion of the HCP area and the Oso Flaco Creek watershed in the southern portion of the HCP area.

The Arroyo Grande Creek watershed covers approximately 150 square miles in the southern portion of San Luis Obispo County. The water quality and quantity of Arroyo Grande Creek and Estuary are influenced by water uses upstream. Lopez Dam impounds about 67 square miles of the watershed and is a primary water supply for some local municipalities and agricultural interests. Small domestic and agricultural water uses downstream of Lopez Dam also reduce the amount of surface water available for the lower reaches of Arroyo Grande Creek. In dry or drought years, groundwater pumping and surface diversions may cause portions of lower Arroyo Grande Creek to completely dry up, resulting in dry creek beds and a much smaller lagoon (Rischbieter 2008, 2009a, 2013). During summer months or during extremely dry winters when stormwater runoff and baseflow are the lowest, the creek becomes impounded and forms a lagoon instead of flowing into the ocean. Below Lopez Dam, Arroyo Grande Creek is listed on the Clean Water Act section 303(d) Impaired Waters List for *E. coli* and fecal coliform from urban runoff, grazing, and agricultural activities (State Water Resources Control Board 2010).

Within the HCP area, the Arroyo Grande Creek watershed historically also included the lower portion of Pismo Creek, located to the north of Arroyo Grande Creek. Prior to 1911 when an extreme flood event occurred, Pismo Creek's lower drainage included Pismo Lake and what today is called Meadow Creek. Lower Pismo Creek joined with Arroyo Grande Creek in its lowest reaches and flowed into the ocean. Grading in the 1950s rerouted Pismo Creek to its current configuration. The Pismo Creek channel/lagoon system trends southerly with a break in the barrier beach generally occurring one to several hundred yards south of Addie Street. The lagoon forms seasonally at the mouth of Pismo Creek, varying annually in size depending on rainfall and on sand drift and accumulation.

Pismo Lake lies 0.5 mile east of the Pacific Ocean and is part of the Meadow Creek/Arroyo Grande Creek watershed, with the upper reaches of Meadow Creek feeding into Pismo Lake at Fourth Street in the City of Pismo Beach. Pismo Lake then flows into the lower reaches of Meadow Creek at the Union Pacific Railroad crossing and State Route 1. The construction of the Union Pacific Railroad was likely one of the first major alterations to the hydrology of this watershed. Meadow Creek is a remnant marsh drainage system that drains Pismo Lake, flows south in the HCP area to the North Beach Campground through the Pismo State Beach Golf Course, and empties into the Oceano Lagoon. Meadow Creek then enters Arroyo Grande Creek just upstream of its confluence with the ocean. Flood control flapgates were installed at the point where Meadow Creek meets the Arroyo Grande Creek Flood Control Channel levee to prevent storm surge backwater from infiltrating the lowland marsh area and damaging nearby homes. Carpenter Creek is a small outfall off of Meadow Creek that can occasionally connect to the Pismo Creek Lagoon south of the North Beach Campground (Map 7).

The Oso Flaco Creek watershed contains approximately 7,400 acres, nearly all of which consist of prime agricultural land. Oso Flaco Creek flows into Oso Flaco Lake and ultimately to the Pacific Ocean. At approximately 39 acres, Oso Flaco Lake is the largest of the freshwater lakes associated with the Guadalupe-Nipomo Dunes complex and the only such lake within the HCP area. Water quality in the Oso Flaco watershed has been found by the Regional Water Quality Control Board to be impaired by several pollutants, including pesticides, nitrate, and excessive sediment (CSLRCD 2013). A fish consumption advisory is posted at Oso Flaco Lake due to high levels of mercury, pesticides, and PCBs (Office of Environmental Health Hazard Assessment 2013).

3.1.4 Land Use and Acquisition Background

Land uses adjacent to the HCP area include extensive urban development (e.g., numerous tourist-related businesses on the north and northeast boundaries of the HCP area). Agricultural fields are contiguous with the Dunes Preserve and southeast boundary of Oceano Dunes SVRA. The Phillips 66 oil refinery is located immediately east of the Phillips 66 leasehold. The Dune Lakes Limited property, a large, privately held and mostly undeveloped area of land with numerous, small freshwater lakes, adjoins the northwest border of Oceano Dunes SVRA, and the Guadalupe-Nipomo Dunes Wildlife Refuge adjoins the southern boundary (

Map 1). Existing land uses within the HCP area are described in depth in section 1.5.9 and Chapter 2 and are shown in Map 3. The history of CDPR land acquisition in the HCP area and the evolution of land uses is provided in section 4.11.1.

3.1.5 HCP Area Habitats

The HCP area consists of open sand, foredunes and backdunes, dune scrub, vegetation islands interspersed within the dunes, dune lakes, freshwater streams, coastal lagoons, wetlands, riparian habitats, and woodlands, along with agricultural and developed areas. In 2022, CDPR mapped vegetation within the HCP area boundaries under the CDFW Vegetation Classification and Mapping Program (VegCAMP) which uses the Manual of California Vegetation (Sawyer, Keeler-Wolf and Evans 2009) classification system. In 2024, updates were made to the dataset to reflect changes to vegetation cover since 2022, notably restoration and dust mitigation planting areas. The vegetation types within the HCP area are discussed below in section 3.1.5.1.

The sandy beaches in the HCP area are a harsh environment where most plants are unable to survive. Located behind them are the dunes, which may be divided into two zones—foredunes and backdunes—characterized by their location and dominant vegetation. Foredunes, which begin at the high tide line and include vast natural areas of open sand sheet, are characterized as low wind-deposited dunes that are sparsely vegetated with the hardiest of dune stabilizing plants. When vegetation can gain a foothold, only low-growing plants with deep root systems can survive, such as sand verbena and beach bur. The strong winds, storm waves, salt spray, lack of freshwater, nutrient-poor substrate (i.e., sand), and alternating periods of sand burial and erosion make this area uninhabitable for other types of plants. The backdunes, located behind the foredunes, are more stabilized and vegetated than the foredunes due to less wind and other erosive forces. The backdunes are dominated by dune scrub species like mock heather, silver dune lupine, seacliff buckwheat (*Eriogonum parviflorum*), and dune ragwort (*Senecio blochmaniae*).

Wetland and riparian habitats can be found surrounding Oso Flaco Lake, Little Oso Flaco Lake, and Pismo Lake and are also scattered throughout the South Oso Flaco area and the Phillips 66 leasehold area and along streams. The wetlands include the areas that hold and maintain water, such as salt marshes, fresh- and brackish-water marshes, swamps, mudflats, and the dune slack lakes. Dune slack lakes are flats eroded by wind down to the water table to form wetland “slacks” (i.e., seasonally flooded marshes and flats near sea level). Plants that live within these coastal wetland environments are adapted to dynamic environmental conditions, including high salinity concentrations and extreme temperatures (M. McLeod 2001).

Woodland habitats are limited in size and largely composed of non-native species, including eucalyptus (*Eucalyptus* sp.) and Monterey pine (*Pinus radiata*). A few native coast live oaks (*Quercus agrifolia*) are present, scattered as single trees in the backdunes. The pines are similarly scattered, but the eucalyptus form groves at some sites, including the Pismo State Beach monarch grove near State Route 1.

Weeds threatening native plant life have been introduced into the dune environment both purposefully and accidentally. Various native plants are choked out by invasive species like European beach grass, perennial veldt grass, and iceplant. These species were all planted to stabilize the dunes many years prior to CDPR acquisition (California Geological Survey (CGS) 2007) and are still sometimes planted by neighboring landowners. The foredune system of the Dunes Preserve is stabilized with these species, which form dense mats, and is thus unusually tall in comparison to other foredunes in Oceano Dunes SVRA that are stabilized with native vegetation. The Oceano Dunes District actively controls European beach grass, perennial veldt grass, jubata grass, iceplant, Cape ivy, and Russian wheat grass.

3.1.5.1 Vegetation of the HCP Area

A concise summary of identified vegetation types is presented below, with corresponding acreages listed in Table 3-1. Vegetation community classification adhered to the established protocols outlined in the Manual of California Vegetation, Second Edition (MCV2) (Sawyer, Keeler-Wolf and Evans 2009) and Online Edition (CNPS 2024). Communities were assigned to existing alliance or association categories within the MCV2 framework.

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024)

Alliance or Landcover Name	System[1]	Rarity Status (Global/ State)[2]	Nativity Status[3]	Location within HCP	Upland/ Wetland[4]	Acres	% of Total HCP Area
Shrublands							
Acacia (*cyclops*, *dealbata*) Shrubland Association Wattle Semi-Natural Stands	District	GNA/ SNA	Non-Native	Backdunes	Upland	44.25	0.88
Baccharis pilularis Shrubland Alliance Coyote brush scrub	MCV	G4/S4	Native	Backdunes	Upland	24.09	0.48
Coreopsis gigantea Shrubland Alliance Giant coreopsis scrub	MCV	G3/S3	Native	Backdunes	Upland	6.36	0.13
Ericameria ericoides Shrubland Association Mock heather scrub	MCV	G3/S3	Native	Backdunes	Upland	257.27	5.14
Frangula californica ssp. *californica* Provisional Shrubland Association California Buckthorn scrub	MCV	G3/S3	Native	Backdunes	Upland	1.75	0.03
Lupinus chamissonis – *Ericameria ericoides* Shrubland Alliance Silver dune lupine–mock heather scrub	MCV	G2/S2.2	Native	Backdunes	Upland	786.28	15.71

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024)

Alliance or Landcover Name	System[1]	Rarity Status (Global/ State)[2]	Nativity Status[3]	Location within HCP	Upland/ Wetland[4]	Acres	% of Total HCP Area
Lupinus chamissonis Shrubland Association Silver dune lupine scrub	MCV	G3/S3	Native	Backdunes	Upland	577.54	11.54
Rubus spectabilis – Morella californica Shrubland Alliance Salmonberry - Wax myrtle scrub	MCV	G4/S3	Native	Backdunes	Wetland	31.82	0.64
Rubus ursinus Shrubland Association California Blackberry Shrubland	MCV	GNA/S4	Native	Backdunes	Upland	1.30	0.03
Salix lasiolepis Shrubland Alliance Arroyo willow thickets	MCV	G4/S4	Native	Backdunes	Wetland	449.43	8.98
Toxicodendron diversilobum Shrubland Alliance Poison oak scrub	MCV	G4/S4	Native	Backdunes	Upland	0.17	0.003
Herblands and Grasslands							
Abronia latifolia – Ambrosia chamissonis Herbaceous Alliance Dune mat	MCV	G3/S3	Native	Foredunes	Upland	305.10	6.10

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024)

Alliance or Landcover Name	System[1]	Rarity Status (Global/ State)[2]	Nativity Status[3]	Location within HCP	Upland/ Wetland[4]	Acres	% of Total HCP Area
Ammophila arenaria Herbaceous Semi-Natural Alliance European beach grass swards	MCV	GNA/ SNA	Non-native	Foredunes	Upland	59.45	1.19
Cakile (*edentula*, *maritima*) Provisional Herbaceous Semi-Natural Alliance Searocket sands	MCV	GNA/ SNA	Non-native	Foredunes	Both	12.21	0.24
Californian Annual Grassland & Forb Meadow Group	MCV	G3/ SNA	Native	Backdunes	Upland	16.82	0.34
Californian Ruderal Grassland, Meadow & Scrub Group	MCV	GNA/ SNA	Non-Native	Backdunes	Upland	4.21	0.08
Corethrogyne filaginifolia – Eriogonum (*elongatum*, *nudum*) Herbaceous Alliance Sand-aster and perennial buckwheat fields	MCV	G4/S4	Native	Backdunes	Upland	5.09	0.10
Juncus lescurii Herbaceous Association Salt rush swales	MCV	G3/S2	Native	Backdunes	Wetland	5.62	0.11
Mesembryanthemum spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance Ice plant mats	MCV	GNA/ SNA	Non-Native	Both	Upland	23.04	0.46

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024)

Alliance or Landcover Name	System[1]	Rarity Status (Global/ State)[2]	Nativity Status[3]	Location within HCP	Upland/ Wetland[4]	Acres	% of Total HCP Area
Sarcocornia pacifica (*Salicornia depressa*) Herbaceous Alliance Pickleweed mats	MCV	G4/S3	Native	Backdunes	Wetland	1.20	0.02
Schoenoplectus (*acutus*, *californicus*) Herbaceous Alliance California bulrush marsh	MCV	GNA/ S3S4	Native	Backdunes	Wetland	40.85	0.82
Typha (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance Cattail marshes	MCV	G5/S5	Native	Backdunes	Wetland	2.46	0.05
Forest and Woodlands							
Eucalyptus (*globulus*, *camaldulensis*) Woodland Semi-Natural Association Eucalyptus groves	MCV	GNA/ SNA	Non-native	Backdunes	Upland	15.73	0.31
Hesperocyparis (*pigmaea*, *abramsiana*, *macrocarpa*, *goveniana*) Woodland Alliance California coastal cypress woodland	MCV	G2/S2	Native	Backdunes	Upland	2.54	0.05

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024)

Alliance or Landcover Name	System[1]	Rarity Status (Global/ State)[2]	Nativity Status[3]	Location within HCP	Upland/ Wetland[4]	Acres	% of Total HCP Area
Hesperocyparis macrocarpa – Pinus radiata Forest and Woodland Semi-Natural Alliance Monterey cypress - Monterey pine Woodland stands	MCV	GNA/ SNA	Non-native	Backdunes	Upland	12.61	0.25
Pinus muricata – Pinus radiata Forest and Woodland Alliance Bishop pine - Monterey pine forest and woodland	MCV	G3/S3.2[5]	Non-Native	Backdunes	Upland	1.34	0.03
Populus trichocarpa Forest and Woodland Alliance Black cottonwood forest and woodland	MCV	G5/S3	Native	Backdunes	Both	11.94	0.24
Quercus agrifolia Forest and Woodland Alliance Coast live oak woodland and forest	MCV	G5/S4	Native	Backdunes	Upland	9.60	0.19
Other Landcover							
Sand	District	N/A	N/A	Foredunes	N/A	2023.50	40.43
Water	District	N/A	N/A	Both	N/A	78.55	1.57
Agriculuture	District	N/A	N/A	Both	N/A	119.08	2.38
Urban	District	N/A	N/A	Both	N/A	74.06	1.47

Table 3-1. Vegetation Type and Other Land Coverage, including Acreages within the HCP (2022, as updated in 2024)

Alliance or Landcover Name	System[1]	Rarity Status (Global/ State)[2]	Nativity Status[3]	Location within HCP	Upland/ Wetland[4]	Acres	% of Total HCP Area

[1] Alliance derived from A Manual of California Vegetation, Second Edition or Online Edition (MCV)

[2] Rarity Ranks:

GNA/SNA = Global/State Unranked

G1/S1 = Global/ State Critically Imperiled

G2/S2 = Global/State Imperiled

G3/S3 = Global State Vulnerable

G4/S4 = Global/State Apparently Secure

G5/G5 = Global/State Secure

Note: Natural Communities with Global or State ranks of 1-3 are considered sensitive by CDFW. Landcovers that do not have ratings (i.e., GNR/SNR) are not considered sensitive and generally constitute non-native or disturbed habitats.

[3] Non-native= native to California, but not to the study area.

[4] Wetland alliances include those with a dominant plant species that is listed by the USACE (2024) as obligate (OBL) or facultative wetland (FACW) plants in the Arid West Region. OBL means almost always a hydrophyte, rarely in uplands; while FACW means usually a hydrophyte but occasionally found in uplands. Alliances listed as "both" have dominant plants that are facultative (FAC), meaning it commonly occurs as either a hydrophyte or non-hydrophyte.

[5] This taxon is not endemic to the HCP area and therefore is not considered sensitive, as it was introduced and is not a naturally occurring population.

All mapping conducted in 2022 by CDPR under CDFW VegCAMP program, following MCV classifications, and updated in 2024.

3.1.5.1.1 Shrublands

Shrublands in the HCP include the following 11 communities including six that have rare statuses (indicated with an asterisk, *) and 5 that are non-native : *Acacia* (*cyclops*, *dealbata*) Shrubland Association (Wattle Semi-Natural Stands, 44.26 acres), *Baccharis pilularis* Shrubland Alliance (Coyote brush scrub Shrubland, 24.09 acres), *Coreopsis gigantea* Shrubland Alliance (Giant coreopsis scrub, 6.36 acres)*, *Ericameria ericoides* Shrubland Association (Mock heather scrub, 257.27 acres)*, *Frangula californica* ssp. *californica* Provisional Shrubland Association (California Buckthorn scrub, 1.75 acres)*, *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance (Silver dune lupine–mock heather scrub, 786.28 acres)*, *Lupinus chamissonis* Shrubland Association (Silver dune lupine scrub, 577.54 acres)*, *Rubus spectabilis – Morella californica* Shrubland Alliance (Salmonberry - Wax myrtle scrub, 31.82 acres)*, *Rubus ursinus* Shrubland Association (California Blackberry Shrubland, 1.30 acres), *Salix lasiolepis* Shrubland Alliance (Arroyo willow thickets, 449.44 acres),and *Toxicodendron diversilobum* Shrubland Alliance (Poison oak scrub, 0.17 acres). Of these only two are typically located in wetland environments (*Rubus ursinus* Shrubland Association and *Toxicodendron diversilobum* Shrubland Alliance) and only one is non-native (*Acacia* (*cyclops*, *dealbata*) Shrubland Association). All of these communities are located in the backdunes regions of the park.

3.1.5.1.2 Herblands and Grasslands

Herblands and Grasslands in the HCP include the following 11 communities including five that have rare statuses (indicated with an asterisk, *) and four that are non-native (indicated with a

dagger, †): *Abronia latifolia – Ambrosia chamissonis* Herbaceous Alliance (Dune mat, 305.07 acres)*, *Ammophila arenaria* Herbaceous Semi-Natural Alliance (European beach grass swards, 59.45 acres) †, *Cakile* (*edentula*, *maritima*) Provisional Herbaceous Semi-Natural Alliance (Searocket sands, 12.21 acres) †, Californian Annual Grassland & Forb Meadow Group (16.82 acres)*, Californian Ruderal Grassland, Meadow & Scrub Group (4.21 acres) †, *Corethrogyne filaginifolia – Eriogonum* (*elongatum*, *nudum*) Herbaceous Alliance (Sand-aster and perennial buckwheat fields, 5.09 acres), *Juncus lescurii* Herbaceous Association (Salt rush swales, 5.62 acres)*, *Mesembryanthemum* spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance (Ice plant mats, 23.04 acres) †, *Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance (Pickleweed mats, 1.20 acres)*, *Schoenoplectus* (*acutus*, *californicus*) Herbaceous Alliance (California bulrush marsh, 40.86 acres)*, and *Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance (Cattail marshes, 2.46 acres). These low growing communities occur in both the foredunes and backdunes of the park. Of these communities at least 4 occur may in wetlands, including *Cakile* (*edentula*, *maritima*) Provisional Herbaceous Semi-Natural Alliance, *Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance, *Schoenoplectus* (*acutus*, *californicus*) Herbaceous Alliance, amd *Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance). Forest and Woodlands

Forest and Woodlands in the HCP include the following six communities including only two that have rare statuses within the HCP (indicated with an asterisk, *) and four that are non-native to the HCP area (indicated with a dagger, †): *Eucalyptus* (*globulus*, *camaldulensis*) Woodland Semi-Natural Association (Eucalyptus groves, 15.73 acres) †,*Hesperocyparis* (*pigmaea*, *abramsiana*, *macrocarpa*, *goveniana*) Woodland Alliance (California coastal cypress woodland, 2.54 acres)*, *Hesperocyparis macrocarpa – Pinus radiata* Forest and Woodland Semi-Natural Alliance (Monterey cypress - Monterey pine Woodland stands, 12.61 acres) †, *Pinus muricata – Pinus radiata* Forest and Woodland Alliance (Bishop pine - Monterey pine forest and woodland, 1.34 acres) †, *Populus trichocarpa* Forest and Woodland Alliance (Black cottonwood forest and woodland, 11.94 acres)*, and *Quercus agrifolia* Forest and Woodland Alliance (Coast live oak woodland and forest, 9.60 acres). All of these alliance occur in the back dunes of the HCP. Only one of these communities (*Populus trichocarpa* Forest and Woodland Alliance) are expected to potentially occur in wetlands.

3.1.5.2 Other Land Cover

Other landcover mapped within the HCP includes Natural Elements [Sand (2023.50 acres) and Water (78.55 acres)] and developed environments [Agriculuture (119.08 acres) and Urban (74.06 acres)]. Sands are mapped in both foredunes and backdunes and consist largely of fine sands associated with low growing vegetation. Waters include both named and unnamed features, such as Oso Flaco Lake and Creek, Pismo Lake and Creek, Arroyo Grande Creek, and Meadow Creek. Agricultural areas consist largely of swaths of land near Oso Flaco Lake and Creek, which are actively used for growing a range of crops. Urban areas mapped include areas that have been developed and are largely at the north end of the HCP, including Pismo State Beach Golf Course, North Beach Campground, Pismo Beach Pier, restrooms, parking lots, and buildings/structures. These features are not considered natural communities and therefore do not have rarity statuses or other protections.

3.1.6 Common Wildlife in the HCP Area

Numerous species of saltwater and freshwater fish, reptiles and amphibians, birds, mammals, and invertebrates also depend on the dune ecosystem in the HCP area. CDPR surveys of Pismo State Beach and Oceano Dunes SVRA have detected at least 28 species of fish, 28 species of reptiles and amphibians, 19 species of mammals, and numerous bird species (CDPR 2024c). Over 304 species of birds live in or migrate through the Guadalupe-Nipomo Dunes Complex (CDPR 2024c). Common wildlife observed in the HCP area are discussed below.

The beach receives nutrients from the ocean that feed its burrowing invertebrate populations. Willets (*Catoptrophorus semipalmatus*), marbled godwits (*Limosa fedoa*), and sanderlings (*Calidris alba*) search for food in the sand. Several species of gulls frequent the beach to scavenge, as do some terrestrial birds such as the Brewer's blackbird (*Euphagus cyanocephalus*) and white-crowned sparrow (*Zonotrichia leucophrys*). Behind the beach, wind-created sand dunes and their vegetation offer some protection for wildlife. Red-winged blackbirds (*Agelaius phoeniceus*), song sparrows (*Melospiza melodia*), and western meadowlarks (*Sturnella neglecta*) take advantage of the seeds provided by the dune vegetation. Deer mice (*Peromyscus maniculatus*) and black-tailed jackrabbits (*Lepus californicus*) forage in the dune scrub and may become food for predators such as great horned owl (*Bubo virginianus*), coyote, and bobcat (*Lynx rufus*). Migrating waterfowl stop over at the wetlands in the HCP area.

The riparian habitats, with their constantly available water and dense, diverse vegetation of trees, shrubs, and herbs, provide abundant food and cover to many wildlife species. The moist riparian area produces abundant insect life, food for many insectivorous amphibians, birds, and mammals such as the Pacific treefrog (*Pseudacris* [=*Hyla*] *regilla*), western skink (*Eumeces skiltonianus*), Wilson's warbler (*Wilsonia pusilla*), black phoebe (*Sayornis nigricans*), Pacific-slope flycatcher (*Empidonax difficilis*), northern rough-winged swallow (*Stelgidopteryx serripennis*), and ornate shrew (*Sorex ornatus*). Omnivorous inhabitants include the big-eared woodrat (*Neotoma macrotis*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). Predators include the garter snake (*Thamnophis* sp.), black-crowned night heron (*Nycticorax nycticorax*), red-shouldered hawk (*Buteo lineatus*), and gray fox (*Urocyon cinereoargenteus*).

Freshwater creeks provide habitat for aquatic macroinvertebrates which, along with vegetative detritus in the form of leaf litter and woody debris, form the base of the stream food chain. Freshwater streams or creeks support resident rainbow trout (*Oncorhynchus mykiss*) and steelhead (i.e., seagoing [anadromous] rainbow trout) as well as other native fishes such as threespine stickleback (*Gasterosteus aculeatus*) and prickly sculpin (*Cottus asper*). Slow-moving sections of streams provide important habitat for native amphibians and reptiles such as CRLF and western pond turtles (*Emys marmorata*). Ephemeral and intermittent tributary streams may provide important habitat for western toad (*Bufo boreas*) and other amphibian species. A high variety of insects, birds, amphibians, reptiles, and mammals utilize the riparian vegetation associated with freshwater streams.

3.2 Identifying Suitable Covered Species' Habitat in the HCP Area

This HCP includes maps of suitable habitat for the covered species to inform the development of the effects analysis (Chapter 4) and the conservation program (Chapter 5). Habitat for each species was determined on the basis of whether or not an area (e.g., sand dunes, lake, creek, etc.) or vegetation alliance (for listed plants) could potentially be occupied based on the species' habitat requirements. The habitat requirements described below are from various sources, including the scientific literature, recovery plans, critical habitat designations, USFWS 5-year reviews, locations of occurrences in the HCP area, and the best professional judgment of CDPR staff with experience working with the covered species in the HCP area. Detailed descriptions of suitable habitat are provided in sections 3.3 and 3.4.

Suitable habitat for covered wildlife species in the HCP area was mapped using Geographic Information System (GIS) and is based on the habitat requirements described in sections 3.3 and 3.4. Suitable habitat for listed plant species was mapped by identifying the vegetation alliances described in section 3.1.5.1 that could be associated with each plant species. Alliances were mapped as suitable habitat for each listed plant species if that plant species was found to occur in that alliance in the HCP area. Alliances were also mapped as suitable habitat if the California Natural Diversity Database (CNDDB) occurrence records from outside the HCP area identified additional vegetation alliances, as indicated by commonly associated species. Refinements between each listed plant species and vegetation alliances were also identified based on the scientific literature, recovery plans, critical habitat designation, USFWS 5-year reviews, and the best professional judgment of CDPR staff with experience working with the covered species in the HCP area.

Beach spectaclepod and surf thistle habitat occur in open and sparsely vegetated sand dunes. Vegetation alliances were not mapped in these areas because they do not support enough vegetation to identify an alliance. Therefore, for beach spectaclepod and surf thistle, habitat in open and sparsely vegetated areas was mapped using physical criteria, such as distance from the mean high tide line.

The covered species' habitat maps likely overestimate suitable habitat, as some modeled habitat may not contain the microhabitat features required by that species. Furthermore, areas mapped as suitable habitat may have some physical and biological features that meet a species' habitat requirements, but past and ongoing activities (e.g., recreation) have disturbed the habitat to the extent that it is not likely to be occupied by the species. As such, it is expected that all mapped habitat will not be occupied or saturated by the covered species.

3.3 Covered Wildlife

The following description of the covered species considers all of the known data on biology, regional distribution, habitat associations, and occurrence of the species within the HCP area as of winter 2015–2016. All relevant tables regarding covered species are included at the end of each section describing the species.

3.3.1 Western Snowy Plover (*Charadrius nivosus nivosus*)

3.3.1.1 Taxonomy, Regional Distribution, and Abundance

The SNPL and the Cuban snowy plover (*C. n. tenuirostris*) are the two distinct subspecies of snowy plover that inhabit portions of North America (American Ornithologist's Union (AOU) 1957). The taxonomy and nomenclature of the SNPL went through revisions in 2010 (USFWS 2012a). The change split the Kentish plover from the snowy plover, adopting the Kentish plover for Palearctic populations (zoogeographical region consisting of Europe, Africa north of the Sahara, and most of Asia north of the Himalayas), and changed the scientific name of the snowy plover in Central and North America to *Charadrius nivosus* (Cassin 1858) with three subspecies: western snowy plover (*C. nivosus nivosus*[33]; previously *C. alexandrinus nivosus*), with a range that includes all of the continental United States and portions of Mexico; Cuban snowy plover (*C. nivosus tenuirostris;* previously *C. alexandrinus nivosus*), with a range that includes Cuba, Puerto Rico, the Caribbean and the Yucatan Peninsula; and, Peruvian snowy plover

[33] =*Anarhynchus nivosus nivosus* (American Ornithological Society 2024).

(*C. nivosus occidentalis;* previously *C. alexandrinus occidentalis*), with a range that includes South America (USFWS 2012a).

The SNPL in the HCP area is the Pacific Coast population. The Pacific Coast population is defined as the individuals that occupy breeding sites along the Pacific Ocean on the North American mainland coast, peninsula offshore islands, interior bays, estuaries, and rivers (USFWS 2007a). This population was listed as threatened under FESA in 1993.

Annual window surveys give an estimate of the size of the adult breeding population of SNPL at known breeding locations along the U.S. Pacific Coast. Window surveys are a one-time pass made by a surveyor or team of surveyors through SNPL nesting habitat between the last week of May and first week of June. The surveyor counts all adult SNPL and identifies the sex of adults when possible (USFWS 2007a). The surveys were initiated by PRBO Conservation Science (PRBO) in 1977 and have subsequently been conducted in 1978–1980, 1989, 1991, 1995, 2000, and annually since 2002. Window surveys have been coordinated by USFWS since 2005. Because SNPL move throughout the season, this one-time "snapshot" approach may be the best way to estimate the total number of breeding birds on the U.S. Pacific Coast. Breeding population estimates by state, county, and USFWS Recovery Plan recovery unit are provided in Table 3-3.

3.3.1.2 Habitat Associations

SNPL breed and forage on sandy beaches. Nests are typically found on flat, open areas of the back beach or backdunes where vegetation is sparse or non-existent (Stenzel, Peaslee and Page 1981). Low or sparse vegetation allows the birds to visually detect approaching predators or other potential threats at a distance. Areas that have been overgrown by introduced European beach grass are not suitable as nesting habitat. After nests hatch, broods tend to move into areas where there is at least some vegetation or beach debris, which provides cover from the heat of the sun, inclement weather, and predators. In general, SNPL nests are most often located within 328 feet (100 meters) of water, or at least within sight of it (Stenzel, Peaslee and Page 1981) (USFWS 2007a). While this may be true for most of the beaches along the San Luis Obispo County coast, which tends to be fairly narrow, it is not the case at Pismo State Beach and Oceano Dunes SVRA. SNPL nests in the HCP area may be located several hundred feet from the nearest water source (Map 11a-d), and they are sometimes tucked into areas sheltered from wind behind foredunes where views of the ocean are blocked.

Along the Pacific Ocean coastline, SNPL forage in a wide variety of habitat types, from the dry sandy regions of the backdunes to wet sands, beach-cast kelp, and wrack lines along the lower beaches. They may use freshwater edges such as the mouths of creeks as they cross beaches and the edges of lagoons. Their diet can vary considerably but it primarily consists of small marine and terrestrial invertebrates. They also pick insects off of vegetation, probe sand, and occasionally take small fish (USFWS 2007a).

SNPL forage both day and night, and microhabitats used for foraging may vary between day and night and by time of year. With their large eyes and keen vision, SNPL are especially well-equipped for nocturnal foraging. During a series of nighttime surveys conducted at Oceano Dunes SVRA, researchers observed nocturnal SNPL foraging behavior (Burton and Kutilek 1997). Burton and Kutilek (1997) found that far fewer birds foraged along the shoreline at night during the breeding season than during the non-breeding season. Birds that were observed foraging at night during the breeding season tended to remain near their nesting areas, while nocturnal foraging birds were widely distributed along the entire beach during the non-breeding season. In a subsequent nocturnal study of plovers and other shorebirds conducted at Oceano Dunes SVRA, SNPL were encountered on the shoreline as frequently at night as in the day (Mad River Biologists 2005).

Throughout the non-breeding season, SNPL along the coast tend to aggregate in loose flocks along the beach, often around the mouths of freshwater creeks and rivers and along the swash line or upper beach. These flocks may consist of resident adults, juveniles born in the area, overwintering birds that breed elsewhere along the Pacific Coast and interior sites (Warriner, et al. 1986), and transitory adults and juvenile birds on migration.

3.3.1.3 Breeding

SNPL that nest on central California beaches typically begin to form breeding pairs by mid-March. Eggs are laid in a small scrape formed as a shallow depression in sand or gravel that may be partially decorated with shell fragments or other small debris. SNPL typically lay a clutch of three eggs and can range from two to four eggs. Eggs are incubated for 26 to 32 days. Newly hatched chicks remain in or nearby their nests for a period of several hours, protected from predators by their cryptic coloration, which is a near perfect match to most sandy substrates. Soon after hatching, the precocial chicks are able to move about and are capable of foraging on their own. Fledging, or flight capability, typically occurs between 29 and 33 days after hatching. In most cases the female attends the chicks for up to 6 days, after which she abandons the brood, leaving their care to the male (Warriner, et al. 1986). Females may then breed with a different male and produce a second brood, and may have up to three broods within a single nesting season (G. W. Page, L. E. Stenzel, et al. 2009). After remaining with the chicks for 29 to 47 days, males may also nest a second time with a different female.

3.3.1.4 Population Status in the HCP Area

3.3.1.4.1 Breeding

Intensive monitoring of the breeding SNPL population in the HCP area provides valuable data for estimating the breeding population size in the HCP area. The number of breeding individuals (Figure 3-1) is estimated from observations of nests, rather than from counts of banded adults, because not all adult SNPL are banded and readily counted.

Although the number of breeding SNPL in the HCP area has been estimated using range-wide window surveys (Table 3-4), this method (Appendix I) does not provide the best estimate for SNPL breeding pairs in the HCP area. Range-wide surveys may underestimate the number of birds at a particular site since some adults are very secretive and avoid detection, or the timing of the window survey may not coincide with the peak number of nesters at a particular site. Therefore, SNPL breeding pair estimates in this document were obtained using data from the Oceano Dunes District SNPL conservation program. Methods for obtaining breeding pair estimates are described in the SNPL annual monitoring reports for Oceano Dunes SVRA (CDPR 2023). Table 3-4 compares the estimated breeding season population sizes of SNPL in the HCP area based on annual window surveys and breeding pair estimates.

3.3.1.4.2 Wintering

Annual SNPL window surveys have been conducted along the Pacific Coast during January since the winter of 2003–2004, using methods similar to those used in the breeding season. Within the HCP area, winter window surveys are conducted at Pismo State Beach and Oceano Dunes SVRA, including a separate survey of the Oso Flaco area. Oceano Dunes SVRA is an important overwintering site for SNPL in San Luis Obispo county: the numbers of SNPL observed at Oceano Dunes SVRA during winter surveys have been the highest of all sites surveyed in San Luis Obispo County since the winter of 2004–2005, except for the winter of 2019–2020 when one other site had higher numbers of SNPL (Table 3-5).

Since 2009, Oceano Dunes District resource staff have conducted more intensive surveys for SNPL at approximately weekly intervals during the winter months (October through February). The shoreline is divided into the following five sections listed from north to south:

1. Approximately 0.5 miles north of Pismo Pier to Grand Avenue (pedestrian use only; no non-CDPR vehicle use allowed)
2. Grand Avenue south to Post 2 (street-legal vehicles and day use only; no camping)
3. Post 2 south to Post 6 (street-legal vehicles, OHVs, and camping allowed year around)
4. Post 6 south to the southern shoreline open riding area boundary (shore and portion of upper beach closed to public use during March 1 through September 30 and open to all activities during the rest of the year)
5. Oso Flaco (southern shoreline open riding area boundary to Oceano Dunes SVRA's southern boundary with pedestrian use only and a portion of shore and upper beach closed to pedestrian use March 1 through September 30).

Monthly averages are taken from one to five weekly surveys for each section of beach during the months from October through February (Table 3-6). The majority of SNPL observed during the surveys were located between Post 2 and Post 6, where OHV use and street-legal vehicles are allowed. Within this area, foraging birds and roosting flock locations are scattered throughout this area, with larger flocks at Post 2 and between Post 4 to Post 6. In previous years, the area between Grand Avenue and Post 2 held the majority of wintering plover flocks.

Banded SNPL are regularly observed on the weekly winter surveys. The majority of the banded birds observed were banded at Oceano Dunes SVRA. In 2023, for example, 78 banded SNPL were recorded during winter surveys from October 1, 2022, to February 28, 2023. Of these banded individuals, 60 were banded at Oceano Dunes SVRA, 11 from Vandenberg Space Force Base (VSFB) in Santa Barbara County, 1 from Monterey Bay area in Monterey County, 1 from Eden Landing in Alameda County, 1 from Don Edwards National Wildlife Refuge in south San Francisco Bay, 1 from Point Reyes National Seashore in Marin County, 2 from Douglas and Lane Counties in Oregon, and 1 was from an unknown location (CDPR 2023)

3.3.1.5 Western Snowy Plover Nesting within the HCP Area

A considerable amount of information on SNPL reproduction in the HCP area is available as a result of long-term monitoring by Oceano Dunes District resource staff, researchers from several academic institutions, and other state and federal Resource Agencies. The current protocol (CDPR 2017a) for the ongoing nest monitoring program began in 2001 and has since been implemented annually. As a result, nesting data were gathered under different protocol during the years 1998–2000 and after 2001. In addition, the open riding area has been monitored on a daily basis since 2000 (CDPR 2001a); however, the Southern Exclosure and Oso Flaco area did not receive such intensive monitoring until more recently (i.e., the level of monitoring at Oso Flaco and the non-vehicular areas has been monitored with increasing frequency since 2005). As a result, nesting data were gathered under different monitoring levels during the years 2001–2004 and after 2005. Therefore, caution should be exercised when comparing data that use different protocols or different levels of monitoring intensity. Figure 3-1 summarizes the nesting data discussed in the following sections.

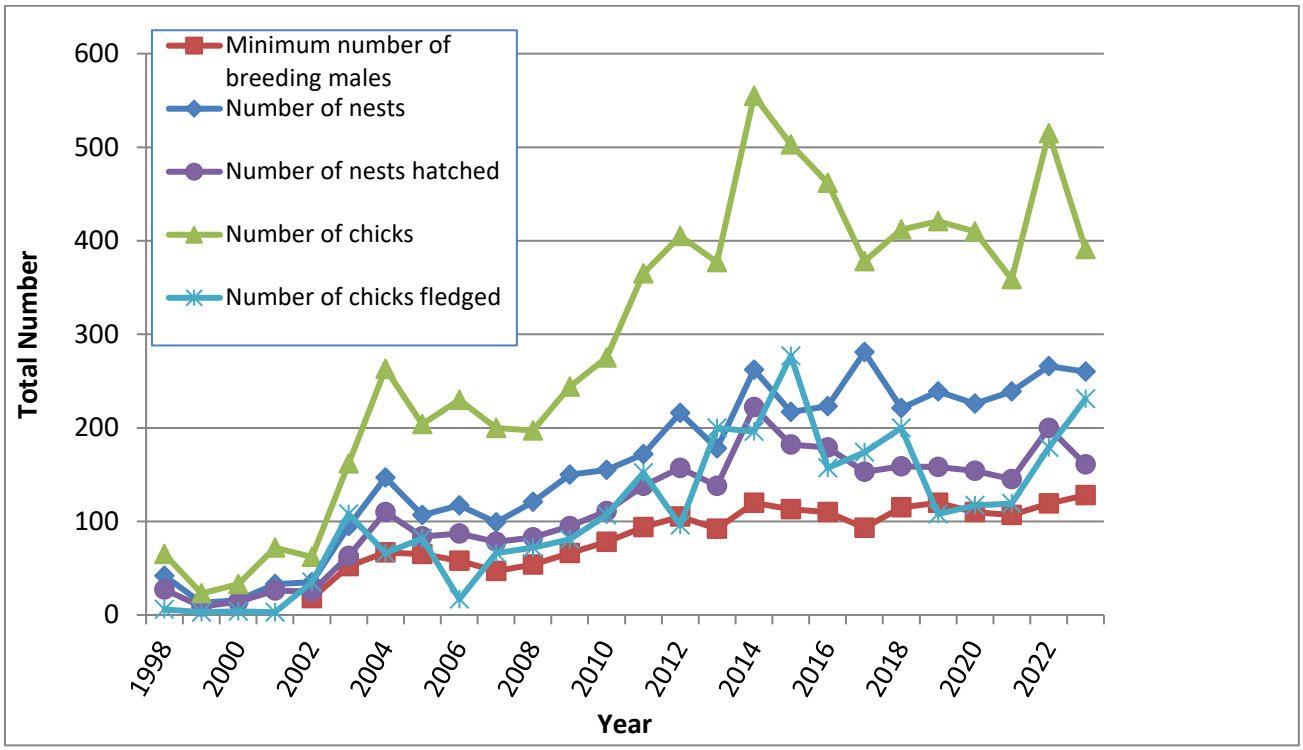


Figure 3-1. Number of SNPL nests, nests hatched, chicks, chicks fledged, and minimum number of breeding males.[34]

3.3.1.5.1 Western Snowy Plover Hatching and Fledging Success in the HCP Area

An upward trend in the average number of nests observed since 1998 (Table 3-7) indicates that management actions aimed at protecting nesting SNPL in the HCP area have been successful. A more thorough discussion of the number of nests, hatching success, and fledging success from 1998 to 2023 follows.

Number of Nests

From 1998 to 2002, the numbers of SNPL nests established ranged from a low of 13 in 1999 to a high of 42 in 1998 (CDPR 1999a, 1999 Western Snowy Plover and California Least Tern Breeding Season at Oceano Dunes State Vehicular Recreation Area, California 1999b). From 2003 to 2017, the number of SNPL nests has generally continued to gradually increase, reaching a high of 281 nests in 2017. From 2018 to 2023, the number of SNPL nests, including nests with unknown locations, has generally leveled off with an average of 241 nests and range of 221-266 nests (Table 3-7; note that the table only lists nests with known locations).

Hatching Success

The primary causes of nest failure (i.e., failure of eggs to hatch) in the HCP area have been depredation by predators, weather-related failure such as being buried by wind-blown sand and tides, non-viable eggs, and abandonment due to the death of parents or other unknown causes; see George (2002, 2003)

[34] Prior to 2001, monitoring in Oso Flaco and Pismo Dunes Natural Preserve was intermittent and fledging data were not obtained (CDPR 2015a).

and CDPR Annual CLTE and SNPL Nesting Season Reports, CDPR (Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2004 Season 2004) - (Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2023 Season 2023). Intensive efforts to protect nests from predators and human disturbance have been made in the HCP area to improve hatching rates. From 2002–2023, an average of 73 percent of the SNPL nests established within the HCP area (with known fate and location) hatched (Table 3-7). The lowest hatching rate in the HCP area occurred in 2023 when only approximately 57 percent of nests hatched. The greatest hatching rate in the HCP area between 2002 and 2023 occurred in 2014 and 2015 when approximately 86 percent of nests hatched each year (Table 3-7).

Fledging Success

CDPR has implemented intensive efforts to protect nests from predators and human disturbance and to improve fledging rates in the HCP area. Although nest hatch rates are an important indicator of successful management actions, fledging success is a better index of reproductive success, as fledging success incorporates survivorship through the incubation and brooding stages. Furthermore, mortality during the brooding period can be high when chicks are highly vulnerable to predation, limiting recruitment into the adult breeding population. Accurate estimates of fledging rates require that the majority of chicks are banded so they can be identified and their fates determined. A SNPL banding program designed to facilitate quantification of fledging success at Oceano Dunes SVRA was implemented in 1998. However, birds hatched in the beginning of the 1998 and 1999 breeding seasons were not banded, so fledging rates for these years could not be accurately assessed. Since 2001, SNPL chicks have been banded throughout the breeding season, and therefore, estimates of fledging rates starting in 2001 are the most accurate to date. Since 2001, the annual fledging rate has ranged between approximately 4 and 66 percent (Table 3-7).

Most SNPL plover broods are initially led from the nest by the parent(s) to the nearest shore to forage. Close proximity of quality shoreline habitat for raising chicks can decrease the likelihood that young chicks will be exposed to sources of mortality (e.g., inclement weather, predators) and increase fledging success (Page and Stenzel 1981, Colwell, Hurley, et al. 2007). The primary cause of mortality for chicks and juveniles in the HCP area is predation. Henkel (2001) reported finding the bands of at least seven SNPL chicks (hatched in the open riding area) in loggerhead shrike regurgitation pellets—a finding that clearly implicated shrike predation as an important cause of mortality for SNPL chicks. CDPR initiated a predator management program in the 2002 breeding season, which has continued in subsequent seasons. Shrikes are just one of many predators of SNPL adults, juveniles, and chicks in the HCP area. In addition to shrikes, other documented predators of SNPL observed in the HCP area include, but are not limited to, coyotes, skunks (*Mephitis mephitis*), ravens, northern harriers (*Circus hudsonius*), peregrine falcons (*Falco peregrinus*), American kestrels (*Falco sparverius*), merlins (*Falco columbarius*), great horned owls, and gulls.

The SNPL Recovery Plan suggests a target of 1.0 chick fledged per breeding male for population stability and 1.2 chicks fledged per breeding male for population growth (USFWS 2007a). For the 22-year period from 2002–2023, the average annual number of juveniles fledged per breeding male was 1.45, and the number of chicks fledged per breeding male exceeded 1.2 in 16 of the 22 years (Table 3-7, Figure 3-2). As a result, it appears that management actions directed toward enhancing SNPL reproduction in the HCP area were successful at keeping the fledging rates above the SNPL Recovery Plan target level of 1.0 chick fledged per breeding pair. Although the management actions appear to be successful, it might be unrealistic to expect an increase in hatching rate and fledging rates relative to current numbers since other factors, such as environmental conditions (e.g., inclement weather, differences in habitat

characteristics) (Colwell, Millett, et al. 2005, 2007, Arrival Times, Laying Dates, and Reproductive Success of Snowy Plovers in Two Habitats in Coastal Northern California 2010), management strategy (e.g., the size of the Exclosures), and physiology (e.g., inability to thermoregulate) (Colwell, Hurley, et al. 2007), might be setting the upper limits of these demographic measures.

3.3.1.6 Regulatory Status, Critical Habitat, and Recovery Plan

In addition to being listed as threatened under FESA, the SNPL is also a CDFW species of special concern. The USFWS has designated critical habitat and finalized a recovery plan for the species.

3.3.1.6.1 Critical Habitat

The USFWS finalized the current critical habitat designation for the Pacific Coast SNPL population in 2012 (USFWS 2012a). The designation includes 24,527 acres in 60 units in Washington, Oregon, and California. The Pismo Beach/Nipomo Dunes unit (Unit CA 31) contains critical habitat within the HCP area.

Pismo Beach/Nipomo Dunes (Unit CA 31) includes 1,652 acres, of which 780 acres (47 percent of Unit CA 31; 3 percent of all designated SNPL critical habitat) occurs within the HCP area in Pismo State Beach and Oceano Dunes SVRA. The HCP area critical habitat extends along the coast from just north of Arroyo Grande Creek south through the southern end of Oceano Dunes SVRA (Map 10). The entire Unit CA 31, including locations outside the HCP area, extends about 12 miles along the coast from the north side of Arroyo Grande Creek at the south end of Strand Way to about 0.4 mile north of Mussel Point (USFWS 2012a) and includes portions of the Guadalupe-Nipomo Dunes National Wildlife Refuge, which is owned and managed by USFWS; the Guadalupe oil field (Guadalupe Restoration Project), which is owned and managed by Chevron Corporation; Rancho Guadalupe County Park, which is owned and managed by the County of Santa Barbara; and private property, including Corralitos Ranch just north of VSFB.

3.3.1.6.2 Recovery Plan

The USFWS finalized the Recovery Plan for SNPL in 2007 (USFWS 2007a). The Recovery Plan divided the Pacific Coast population of the SNPL into six recovery units. Recovery Unit 5 includes the coastal beaches of San Luis Obispo, Santa Barbara, and Ventura counties and encompasses the entire HCP area (Map 10). The Recovery Plan identifies specific areas within each unit that are important for the recovery of SNPL. The USFWS identified 100 specific areas in Recovery Unit 5; the beaches of Oceano Dunes SVRA are within specific area Unit CA-83, which encompasses the Pismo Beach/Nipomo Dunes area.

The Recovery Plan developed population targets for Recovery Units to assess the recovery status of SNPL. The sizes of the minimum subpopulations the Recovery Team projected for each recovery unit is based on historical population sizes, current population sizes, and potential for supporting breeding and wintering SNPL. The Recovery Plan recommends maintaining an average population of 3,000 adults, distributed among the six recovery units for a period of at least 10 years. Based on these criteria, delisting of the overall population requires, in part, that 1,200 adults are consistently breeding within Recovery Unit 5. Additional criteria for delisting include minimum numbers of chicks fledged per male over a 5-year period and the development and implementation of plans and cooperative agreements among various agencies, landowners, and conservation organizations, which will ensure the long-term survival of the subpopulations.

In addition to setting numeric subpopulation targets as recovery criteria for the Recovery Units, the Recovery Plan also provides guidance on management potential for specific breeding locations. The Management Potential Breeding Numbers presented in the Recovery Plan represent population targets that the USFWS estimated can be achieved under intensive management. The technical subteam of the

SNPL Recovery Team[35] developed Management Potential Breeding Numbers for the Recovery Plan, estimating the population levels attainable under intensive management as based on survey data at breeding locations and expert opinion regarding the feasibility of management options and the extent and quality of habitat. The Management Potential Breeding Numbers for the Pismo Beach/Nipomo Dunes area (Unit CA-83) is 350 breeding SNPL (USFWS 2007a).

The Recovery Team identified the role and level of participation of various federal, state, municipal, and private lands and the role of state and local governments in their overall strategy for recovery of the SNPL. In particular, lands managed by CDPR were identified as critical to the long-term survival of the SNPL, in part because park lands can be intensively managed and monitored consistent with park management plans and classifications.

3.3.1.7 HCP Area Conservation Program

CDPR currently manages the SNPL conservation program presented in this HCP to optimize breeding success and reduce potential impacts to SNPL in the HCP area. The conservation program includes such actions as seasonally closing areas to visitors and installing fence and signage around these areas to delineate them; augmenting existing habitat with branches, woodchips, and wrack; and implementing a predator management program. Over the years, CDPR has worked with CDFW and USFWS to modify the conservation program and respond to potential impacts to SNPL. For example, daily monitoring in the open riding area began in 2001, the predator management program began in 2002, a limited number of SNPL eggs or chicks were brought into captivity starting in 2003, and weekly monitoring of SNPL during the non-breeding season began in 2009. In 2000, prior to daily monitoring, predator management, and other activities associated with the conservation program, only 16 nests were located in the HCP area, and only 4 chicks fledged (i.e., 15 percent of the hatched chicks). Starting in 2002, 1 year after daily monitoring began in the open riding area and more regular monitoring began in other portions of the HCP area, 35 nests were located in the HCP area and 35 chicks fledged (i.e., 57 percent of the hatched chicks). Starting in 2003, 1 year after predator management began, 95 nests were located in the HCP area and 108 chicks fledged (68 percent of the hatched chicks). Since 2004, the number of nests has varied between 99 and 281, and the number of chicks fledged has varied between 17[36] and 277 (Table 3-7). Overall, breeding success for SNPL in the HCP area has increased, and this result is likely to be predominantly from CDPR's efforts toward the conservation program.

3.3.1.8 Suitable Habitat in the HCP Area

SNPL nests in the HCP area are typically found in the Southern Exclosure and Oso Flaco during the breeding season. Specifically, most SNPL nests have been found in North Oso Flaco Exclosure, South Oso Flaco, 6 Exclosure, 7 Exclosure, 8 Exclosure, and Boneyard Exclosure (Map 11a-d). SNPL have also nested in the 48-acre foredune area each year since it was closed in 2020 (192 nests from 2020 to 2023). In addition, nests found outside the Southern Exclosure and Oso Flaco from 2005 to 2023 include: 43 nests in the open riding area (21 of which were found in 2020 when the area was closed to vehicles and camping), 14 nests within vegetation islands, 13 nests within a closed buffer area (i.e., within a large single-nest exclosure or bumpout), 6 nests near Arroyo Grande Creek, 1 nest near Pismo Creek Lagoon, 1 nest near Carpenter Creek, and 1 nest in Dunes Preserve (Table 3-7). Although nests have not

[35] Recovery teams serve as independent advisors to the USFWS during preparation of a Recovery Plan.
[36] In 2006, only 17 of 230 chicks (i.e., 7.4 percent) were known to have fledged. Excluding 2006, the number of chicks fledged from 2004–2018 varied from 66 to 277.

previously been found throughout the HCP area, much of the HCP area does contain suitable habitat for SNPL, as shown in Map 10 and described in this section.

SNPL habitat in the HCP area was mapped based on the habitat requirements identified in the scientific literature (Stenzel, Peaslee and Page 1981, Wilson-Jacobs and Meslow 1984, Warriner, et al. 1986, G. W. Page, L. E. Stenzel, et al. 2009, MacDonald, Longcore and Dark 2010), breeding locations identified in the *Recovery Plan for the Pacific Coast Population of the Western SNPL* (USFWS 2007a), location of critical habitat (USFWS 2012a), breeding data through 2023, and the best professional judgment of CDPR staff with experience working with SNPL in the HCP area (Map 10). Portions of the HCP area identified as potential habitat for SNPL support suitable habitat characteristics for SNPL (e.g., foraging habitat along sandy shoreline, nesting habitat in open areas of the back-beach and backdunes where vegetation is sparse or non-existent).

The habitat maps include potentially suitable habitat inside and outside the Exclosures. Past and ongoing park visitor activities at the District have greatly affected the distribution and use of habitat, as SNPL nest almost entirely within the Exclosures, South Oso Flaco, and 48-acre foredune area and rarely nest in habitat subject to intensive park visitor activities (e.g., motorized vehicle recreation). Despite the present distribution of nesting SNPL at Oceano Dunes District, area within the open riding area is identified as potentially suitable habitat because this area supports key habitat elements necessary for breeding, foraging, and roosting SNPL.

Not all potential SNPL habitat will support the same numbers and densities of SNPL. Therefore, for the purposes of this HCP, SNPL habitat was identified as primary, secondary, and tertiary. The identification of habitat as primary, secondary, and tertiary reflects the expected level of use of these habitats by SNPL and allows the HCP analysis to evaluate effect of impacts. For example, primary habitat would support a higher density of nesting SNPL than secondary habitat, which could support a higher density of nesting SNPL than tertiary habitat.

Primary habitat provides all of the necessary physical and biological features to support behavioral activities such as breeding (e.g., nesting, rearing), foraging, and roosting. SNPL forage extensively along shorelines and in the wrack above the high tide line. In dune-backed coastal habitat, SNPL usually nest in sparsely vegetated areas close to water, often within 328 feet (100 meters) (Page and Stenzel 1981). Therefore, primary habitat in the HCP area includes shoreline, beach, and sparsely vegetated foredune habitats that are generally within 492 to 1,640 feet of the shore, extending from Arroyo Grande Creek south to the Oceano Dunes SVRA southern boundary (Map 10). In general, the eastern limit of primary habitat approximates the crest of the first foredune with the majority of the habitat facing north and west.

Secondary habitat provides some or all of the physical and biological features to support behavioral activities such as breeding, foraging, and roosting. Within secondary habitat, some of the physical and biological features that support breeding, foraging, or roosting may be absent, degraded by historical land use, or support physical habitat features that provide lower-quality habitat than those identified in primary habitat. Pismo Beach from Arroyo Grande Creek to Addie street was mapped as secondary habitat, as the habitat in this area has been rendered less suitable for nesting due to historic human activity (Page and Stenzel 1981) and extensive adjacent urban development (Map 10) (Page and Stenzel 1981). Adjacent urban development may indirectly affect SNPL attempting to nest at Pismo Beach by facilitating high levels of human activity at the beach and increasing predator presence.

Potential nesting habitat inland (i.e., east) from primary habitat (from 984 to 1,969 feet from the mean high tide line) was also identified as secondary habitat. SNPL may occasionally attempt to nest in this area, but to a much lesser extent than nesting habitat closer to the mean high tide line. In the area open

to riding and in the Oso Flaco area, secondary habitat was mapped on the south- and east-facing slopes on the leeward side of the largest foredune. This aspect provides some protection from high winds; therefore, this area may be suitable SNPL nesting habitat.

Tertiary habitat provides very little of the physical and biological features to support behavioral activities such as breeding, foraging, and roosting. These features (or the location of these features) are assumed to provide marginal or low-quality habitat because they are generally located far from the shore, contain only low-quality habitat features (e.g., vegetated dunes), or have been highly degraded by historical land uses (e.g., recreation on beaches, indirectly degraded by adjacent urban development). SNPL are anticipated to rarely nest in tertiary habitat or otherwise use this habitat for foraging and roosting. The portion of Pismo Beach located north of Addie Street, including the Pismo Pier (Map 10), was identified as tertiary habitat, since the habitat in this area has rendered unsuitable by historic human activity and adjacent urban development. In addition, tertiary habitat was defined as all other potentially suitable habitats in the HCP area not mapped as primary or secondary.

Lakes, wetlands, and riparian areas were excluded from these habitat classifications since they were not considered suitable SNPL habitat unless they were part of the dynamic dune system. Developed campgrounds, as well as the golf course, corporation yard, parking lots, Pismo State Beach monarch grove, and agricultural areas were also excluded from the habitat classifications since they were not considered suitable SNPL habitat.

In total, 4,513 acres were mapped as suitable SNPL habitat in the HCP area: 698 acres of primary habitat, 250 acres of secondary habitat, and 3,565 acres of tertiary habitat. For the period from 2005–2023, virtually all the SNPL nests with known locations occurred in primary habitat (97 percent) (Table 3-2). This is expected as most of the SNPL nesting in the HCP area nest within the Exclosures, 48-acre foredune area, and South Oso Flaco, which are placed mostly within primary habitat.

Table 3-2. Number of SNPL Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 11)

Year	Primary Habitat	Secondary Habitat	Tertiary Habitat
2005	98	4	0
2006	117	2	1
2007	91	0	0
2008	118	1	0
2009	148	1	0
2010	150	3	0
2011	162	3	0
2012	210	1	0
2013	169	1	0
2014	245	1	0
2015	200	1	0
2016	208	3	0
2017	272	6	1
2018	210	2	0
2019	226	3	0

Table 3-2. Number of SNPL Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 11)

Year	Primary Habitat	Secondary Habitat	Tertiary Habitat
2020	204	8	2
2021	209	11	3
2022	229	4	1
2023	204	7	6
Total	3,470	62	14

Table 3-3. Range-wide SNPL Breeding Survey Results, 2002–2023																						
Region	***Total Adults***																					
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Washington Total*	n/a	n/a	n/a	37	67	50	42	42	38	34	28	46	41	64	102	77	81	98	47	92	58	54
Oregon Total	71	63	82	100	91	125	105	140	158	168	206	222	228	276	375	265	321	381	422	532	483	433
Total Unit 1	**n/a**	**n/a**	**n/a**	**137**	**158**	**175**	**147**	**182**	**196**	**202**	**234**	**268**	**269**	**340**	**477**	**342**	**402**	**479**	**469**	**624**	**541**	**487**
Del Norte County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	3
Humboldt County	49	38	37	32	42	23	18	15	20	27	20	21	27	32	44	53	48	40	37	64	66	53
Mendocino County	0	1	3	9	3	3	0	0	1	1	1	2	0	6	2	3	4	1	9	20	2	8
Total Unit 2	**49**	**39**	**40**	**41**	**45**	**26**	**18**	**15**	**28**	**28**	**21**	**23**	**27**	**38**	**46**	**56**	**52**	**41**	**48**	**84**	**71**	**64**
San Francisco Bay	78	72	113	124	102	207	133	147	275	249	147	202	178	195	202	246	235	190	147	263	281	368
Total Unit 3	**78**	**72**	**113**	**124**	**102**	**207**	**133**	**147**	**275**	**249**	**147**	**202**	**178**	**195**	**202**	**246**	**235**	**190**	**147**	**263**	**281**	**368**
Sonoma County	0	0	0	5	0	0	1	8	0	0	0	0	0	1	0	0	0	5	8	0	1	2
Marin County	25	17	26	22	16	20	25	21	23	13	12	16	37	41	45	45	65	20	39	41	21	45
San Francisco County	n/a	n/a	n/a	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
San Mateo County	3	4	17	2	7	3	1	0	0	5	4	0	0	1	8	8	5	3	4	2	2	4
Santa Cruz County	35	37	54	68	86	75	36	30	34	28	59	66	63	66	69	62	66	47	29	49	38	48

Table 3-3. Range-wide SNPL Breeding Survey Results, 2002–2023

Region	*Total Adults*																					
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Monterey County	249	250	284	239	248	172	194	220	241	265	249	179	274	239	244	254	225	228	228	200	219	2
Total Unit 4	**312**	**308**	**381**	**337**	**357**	**270**	**257**	**279**	**298**	**311**	**324**	**261**	**374**	**348**	**366**	**369**	**361**	**303**	**308**	**292**	**281**	**308**
San Luis Obispo County	232	258	408	413	330	206	262	270	240	312	317	279	373	403	393	374	383	264	208	219	290	207
Santa Barbara County	288	333	483	384	366	286	291	241	243	320	249	260	274	419	271	313	328	344	365	340	315	61
Ventura County	233	170	198	172	221	184	164	196	203	164	205	215	175	141	256	169	163	205	182	178	199	202
Total Unit 5	**753**	**761**	**1,089**	**969**	**917**	**676**	**717**	**707**	**686**	**796**	**771**	**751**	**822**	**963**	**820**	**856**	**874**	**813**	**855**	**737**	**804**	**470**
Los Angeles County	0	0	0	0	0	0	2	1	1	3	0	4	0	2	5	4	8	1	4	3	1	1
Orange County	38	31	31	66	62	36	50	48	62	51	60	55	66	67	88	110	137	102	149	82	87	120
San Diego County	157	233	250	143	236	147	217	208	248	277	298	267	280	307	280	350	306	294	331	273	205	312
Total Unit 6	**195**	**264**	**281**	**209**	**298**	**183**	**269**	**257**	**311**	**331**	**358**	**326**	**346**	**376**	**373**	**464**	**451**	**397**	**484**	**358**	**393**	**433**
California Total	**1,387**	**1,444**	**1,904**	**1,680**	**1,719**	**1,362**	**1,394**	**1,405**	**1,598**	**1,715**	**1,621**	**1,563**	**1,747**	**1,920**	**1,807**	**1,991**	**1,973**	**1,744**	**1,842**	**1,734**	**1,830**	**1,643**
Pacific Coast Total	**n/a**	**n/a**	**n/a**	**1,817**	**1,877**	**1,537**	**1,541**	**1,587**	**1,794**	**1,917**	**1,855**	**1,834**	**2,016**	**2,260**	**2,284**	**2,333**	**2,375**	**2,223**	**2,311**	**2,358**	**2,371**	**2,130**

* In 2006, surveyors in Washington State began following more intensive survey methods, and consequently, more effort was devoted to locating birds than in previous years. As a result, survey results prior to 2006 are not necessarily comparable with those from 2006 through 2016 (Pearson, Sundstrom, et al. 2008).

Sources: USFWS (2016-2017 Winter Rangewide Western Snowy Plover Survey 2017, 2020 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast 2020b, 2021 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast 2021, 2022a, 2023 [Snowy Plover] Winter window survey 2023f)

Table 3-4. Estimated Breeding Season Population Sizes of SNPL in the HCP Area Based on Annual Window Surveys and Intensive Monitoring of Breeding Individuals

Method of Counting	Year																					
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Window survey	–	–	–	92	87	60	102	98	74	112	145	94	180	180	160	174	155	154	155	116	190	124
Calculated minimum number of breeding adults	32	84	121	116	107	79	95	114	137	160	190	163	226	205	209	183	201	214	190	195	206	232
Ratio: window survey/ calculate minimum numbers	–	–	–	0.79	0.81	0.76	1.07	0.86	0.54	0.70	0.76	0.58	0.80	0.88	0.77	0.95	0.77	0.72	0.82	0.59	0.92	0.53

Sources: (George 2002, 2003, CDPR 2004, 2023)

Table 3-5. Number of SNPL Observed During Winter Season Window Surveys in San Luis Obispo County																			
Site*	**2003-2004**	**2004-2005**	**2005-2006**	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**	**2012-2013**	**2013-2014**	**2014-2015**	**2015-2016**	**2016-2017**	**2017-2018**	**2018-2019**	**2019-2020**	**2020-2021**	**2021-2022**	**2022–2023**
San Carpoforo Creek	26	46	52	11	0	53	0	0	16	1	26	0	0	14	0	36	57	46	38	0
Point Sierra Nevada	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arroyo de La Cruz	-	-	-	-	-	-	-	-	2	0	0	0	0	0	0	0	-	0	0	0
Sydney's Lagoon	-	-	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arroyo Laguna Creek	0	-	0	0	0	44	0	31	27	0	0	0	0	6	0	0	0	0	0	0
Little Pico Creek	-	-	-	-	-	-	-	-	28	0	0	0	0	0	0	0	-	0	0	0
San Simeon State Beach	143	54	38	0	43	0	0	0	46	33	93	144	193	0	54	88	0	14	70	45
Santa Rosa State Beach	-	-	-	-	-	-	-	18	0	0	0	0	0	0	4	0	121	84	43	46
Estero Bluffs State Beach	32	45	84	106	10	63	112	52	28	33	0	35	0	0	16	0	56	33	38	27
Toro Creek	0	121	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morro Strand State Beach	249	44	8	10	1	0	105	24	1	81	141	106	5	55	56	2	72	0	86	0
Morro Rock City Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3-5. Number of SNPL Observed During Winter Season Window Surveys in San Luis Obispo County

Site*	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022–2023
Morro Bay Sandspit: City Sector	-	0	63	0	3	26	7	0	0	28	0	37	0	1	2	4	12	0	21	0
Morro Bay Sandspit: State Sector	103	3	41	30	55	19	40	0	0	50	76	130	123	201	23	3	63	0	0	0
Pismo State Beach**	-	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**34**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**3**	**0**	**0**
Oceano Dunes SVRA	**154**	**141**	**91**	**114**	**62**	**89**	**117**	**138**	**118**	**113**	**227**	**219**	**232**	**138**	**112**	**90**	**65**	**96**	**131**	**125**
Oso Flaco	**32**	**18**	**8**	**18**	**0**	**3**	**35**	**18**	**32**	**22**	**34**	**19**	**7**	**0**	**22**	**26**	**69**	**35**	**41**	**38**
Guadalupe-Nipomo Dunes NWR	29	9	5	22	0	22	1	38	44	39	11	19	1	6	17	8	17	3	1	4
Guadalupe Restoration Project (Chevron)	72	57	59	26	37	42	12	16	26	25	2	33	7	17	15	38	79	62	48	53
Total	840	538	449	346	211	361	429	338	402	425	610	742	575	438	321	295	611	376	517	338

*Sites within the HCP area are highlighted in **bold**.

**Pismo State Beach is defined in the surveys as Pismo SB north of Grand Avenue only. North of Pismo Pier to Grand Avenue and Oso Flaco were included in the winter surveys beginning in 2010.

Sources: USFWS (2016-2017 Winter Rangewide Western Snowy Plover Survey 2017, 2020 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast 2020b, 2021 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast 2021, 2022a, 2023 [Snowy Plover] Winter window survey 2023f)

Table 3-6. Average Number of Wintering* SNPL Observed Between October and February in the HCP Area**

Shoreline Section	2009-2010	2010-2011	2011-2012	2012-2013	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Pismo Pier to Grand Avenue	–	–	5–57	77–237	0	0–47	0–9	0–1	0–1	0	0–3	0	0–1
Grand Avenue to Post 2	90–116	44–125	50–129	15–90	83–169	39–103	0–56	4–49	0–19	0–3	0–9	0–5	0–4
Post 2 to Post 6	0–3	0–21	3–26	3–72	15–67	8–50	17–117	5–71	17–63	32–78	66–138	24–106	67–123
Post 6 to Open Riding Area Southern Boundary (Shoreline)	11–45	9–58	11–47	3–94	2–144	11–86	8–89	9–58	24–62	4–25	1–12	37–92	14–90
Oso Flaco	–	15–47	28–39	18–35	0–27	5–63	0–52	25–28	24–55	33–113	22–46	17–40	0–48

*Pacific Coast SNPL joined by interior breeding birds.

**Numbers in this table represent the range of averages for each month of the monitoring year.

Sources: CDPR Annual CLTE and SNPL Nesting Season Reports CDPR (2010) through (2023).

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2023								
Year	**Area**	**No. Known Location Nests[1]**	**No. Nests with Known Location and Fate**	**No. nests with known location hatching**	**% nests hatching[2]**	**No. Chicks from Known Location**	**No. Chicks from Known Location Fledged[3]**	**% Chicks from Known Location Nests Fledged**
2001	Southern Exclosure	25	25	22	88	57	2	4
	Oso Flaco	4	2	2	100	6	1	17
	Open riding area	1	1	0	0	0	0	0
	Arroyo Grande Exclosure [4,5]	3	2	3	100	9	0	0
	Total	**33**	**30**	**27**	**87**	**72**	**3**	**4**
2002	Southern Exclosure	33	33	25	76	62	35	56
	Oso Flaco	2	2	0	0	0	0	0
	Total	**35**	**35**	**25**	**71**	**62**	**35**	**56**
2003	Southern Exclosure	74	73	53	73	136	91	67
	Oso Flaco	13	13	4	31	11	7	64
	Open riding area	1	1	1	100	3	3	100
	Dunes Preserve	1	1	1	100	3	0	0
	Pipeline Reveg	3	3	2	67	4	2	50
	East of BY Exclosure [6]	2	2	1	50	3	2	67
	Total	**94**	**93**	**62**	**67**	**160**	**105**	**66**
2004	Southern Exclosure	113	111	87	78	208	59	28
	Oso Flaco	27	27	17	63	40	7	18
	Open riding area	1	1	0	0	0	0	0
	Pipeline Reveg	1	1	1	100	3	0	0
	Total	**142**	**140**	**105**	**75**	**251**	**66**	**26**
2005	Southern Exclosure	79	79	60	76	142	57	40
	Oso Flaco	22	22	18	82	49	23	47
	East of BY Exclosure [6]	2	2	2	100	6	2	33
	Total	**103**	**103**	**80**	**78**	**197**	**82**	**42**
2006	Southern Exclosure	87	84	65	77	173	8	5
	Oso Flaco	29	29	22	76	57	9	16
	Open riding area	1	1	0	0	0	0	0
	Total	**117**	**114**	**87**	**76**	**230**	**17**	**7**
2007	Southern Exclosure	76	76	61	80	159	58	36
	Oso Flaco	15	15	9	60	20	4	20
	Total	**91**	**91**	**70**	**77**	**179**	**62**	**35**
2008	Southern Exclosure	100	100	73	73	172	64	37
	Oso Flaco	19	19	8	42	19	5	26
	Total	**119**	**119**	**81**	**68**	**191**	**69**	**36**
2009	Southern Exclosure	125	124	86	69	220	79	36
	Oso Flaco	23	22	8	36	22	2	9
	Pismo Creek Lagoon	1	1	0	0	0	0	0
	Total	**149**	**147**	**94**	**64**	**242**	**81**	**33**

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2023								
Year	**Area**	**No. Known Location Nests[1]**	**No. Nests with Known Location and Fate**	**No. nests with known location hatching**	**% nests hatching[2]**	**No. Chicks from Known Location**	**No. Chicks from Known Location Fledged[3]**	**% Chicks from Known Location Nests Fledged**
2010	Southern Exclosure	126	123	95	77	234	86	37
	Oso Flaco	22	22	13	59	33	15	45
	Open riding area	1	1	1	100	2	2	100
	Carpenter Creek	1	1	0	0	0	0	0
	Arroyo Grande Creek	3	3	0	0	0	0	0
	Total	**153**	**150**	**109**	**73**	**269**	**103**	**38**
2011	Southern Exclosure	140	135	113	84	300	129	43
	Oso Flaco	23	23	16	70	40	18	45
	Open riding area	2	2	2	100	5	1	20
	Total	**165**	**160**	**131**	**82**	**345**	**148**	**43**
2012	Southern Exclosure	194	186	143	77	353	85	24
	Oso Flaco	14	14	9	64	21	4	19
	Open riding area	3	3	0	0	0	0	0
	Total	**211**	**203**	**152**	**75**	**374**	**89**	**24**
2013	Southern Exclosure	147	144	115	80	286	123	43
	Oso Flaco	23	23	15	65	38	25	66
	Total	**170**	**167**	**130**	**78**	**324**	**148**	**46**
2014	Southern Exclosure	201	194	173	89	428	142	33
	Oso Flaco	44	44	33	75	86	35	41
	Open riding area	1	1	0	0	0	0	0
	Total	**246**	**239**	**206**	**86**	**514**	**177**	**34**
2015	Southern Exclosure	182	175	153	87	401	215	54
	Oso Flaco	20	20	14	70	39	24	62
	Arroyo Grande Creek[5]	1	-	1	-	2	0	0
	Total	**203**	**195**	**168**	**86**	**442**	**239**	**54**
2016	Southern Exclosure	169	156	136	87	326	94	29
	Oso Flaco	40	37	29	78	82	36	44
	Arroyo Grande Creek[5]	1	-	1	-	2	1	50
	Total	**210**	**193**	**166**	**85**	**410**	**131**	**32**
2017	Southern Exclosure	195	165	107	65	252	105	42
	Oso Flaco	77	72	38	53	96	55	57
	Arroyo Grande Creek	1	1	0	0	0	0	0
	Total	**273**	**238**	**145**	**61**	**348**	**160**	**46**
2018	Southern Exclosure	145	139	111	80	274	131	48
	Oso Flaco	61	61	33	54	84	43	51
	Total	**206**	**200**	**144**	**72**	**358**	**174**	**49**
2019	Southern Exclosure	172	163	118	72	299	81	27
	Oso Flaco	57	56	30	54	75	13	17
	Eucalyptus North	1	1	1	100	3	1	33
	Total	**230**	**220**	**149**	**68**	**377**	**96**	**25**

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2023

Year	Area	No. Known Location Nests[1]	No. Nests with Known Location and Fate	No. nests with known location hatching	% nests hatching[2]	No. Chicks from Known Location	No. Chicks from Known Location Fledged[3]	% Chicks from Known Location Nests Fledged
2020	Southern Exclosure	128	117	85	73	206	56	27
	Oso Flaco	39	35	21	60	55	4	7
	48-acre foredune	25	23	17	74	47	14	30
	Open riding area[7]	21	21	18	86	49	21	43
	Bigfoot veg. island	1	1	1	100	3	0	0
	Total	**214**	**197**	**142**	**72**	**360**	**95**	**27**
2021	Southern Exclosure	132	128	74	58	182	61	34
	Oso Flaco	29	29	11	38	23	9	39
	48-acre foredune	48	48	36	75	90	29	32
	Closed buffer area[8]	7	7	4	57	8	2	25
	Open riding area	4	4	2	50	6	2	33
	Dunes Preserve	1	1	1	100	1	0	0
	Bigfoot	1	1	1	100	2	0	0
	Eucalyptus Tree	1	1	0	0	0	0	0
	Total	**223**	**219**	**129**	**59**	**312**	**103**	**33**
2022	Southern Exclosure	153	145	122	84	298	95	32
	Oso Flaco	20	20	4	20	8	2	25
	48-acre foredune	55	53	38	72	86	39	45
	Closed buffer area	4	4	4	100	12	1	8
	Open riding area	2	2	0	0	0	0	0
	Eucalyptus Tree	1	1	1	100	3	3	100
	Total	**235**	**225**	**169**	**75**	**407**	**140**	**35**
2023	Southern Exclosure	118	112	65	58	161	92	57
	Oso Flaco	18	17	10	59	21	15	71
	48-acre foredune	64	62	36	58	81	41	51
	Closed buffer area	2	2	2	100	5	4	80
	Open riding area	8	8	2	25	4	1	25
	Eucalyptus North	3	3	2	67	6	2	33
	Eucalyptus Tree	4	4	1	25	3	2	67
	Total	**217**	**208**	**118**	**57**	**281**	**157**	**56**

Notes:

Beginning in 2006, an additional 0.4 mile of shoreline at the southern end of park has been monitored by Oceano Dunes SVRA (a survey conducted by the Guadalupe-Nipomo Dunes National Wildlife Refuge in 2005 determined this area was part of Oceano Dunes SVRA and not the refuge, as was previously thought). Between 1998 and 2003, the amount of riding area seasonally closed increased; the size has been relatively stable since 2004.

[1]Does not include nests that were identified only by detection of the brood (unknown nest location).

[2]Percent of nests hatching is calculated using number of hatching nests from known location divided by number of known location and fate nests. Nests with unknown fate or detected only by the presence of brood are excluded.

[3]Chicks whose nest location could not be identified are not included in table.

[4]Arroyo Grande exclosure: A seasonal exclosure (with two-inch by four-inch wire mesh fencing and closed from the riding area) in use in 2001 and 2002, but not subsequently.

[5]In 2001, 2015 and 2016, brood with approximately one- to three-day-old chicks found in Arroyo Grande Creek area, assumed to be from an unknown nest nearby, and included in this table, but excluded from the percent hatch rate.

[6]East of BY Exclosure: Area east of Boneyard Exclosure closed to vehicles year-round and open to pedestrians. There were two nests in 2003

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2023

Year	Area	No. Known Location Nests[1]	No. Nests with Known Location and Fate	No. nests with known location hatching	% nests hatching[2]	No. Chicks from Known Location	No. Chicks from Known Location Fledged[3]	% Chicks from Known Location Nests Fledged

and two nests in 2005. All nests had a single nest wire exclosure (10-foot by 10-foot exclosure).

[7]In 2020, 21 nests located outside closed areas such as Southern Exclosure, 48-acre foredune, Oso Flaco, and revegetation areas included in the open riding area category even though the area was closed to public vehicle and camping access (but open to other public recreation use) for most of the 2020 season (see 2020 annual report for more details).

[8]Beginning in 2021, closed buffer area became a new nesting location in the SNPL and CLTE annual report and is equivalent to a large single-nest exclosure or bumpout as defined in this HCP.

Source: (CDPR 2023)

Table 3-8. Number of SNPL Chicks Fledged Per Breeding Male in the HCP Area, 2002–2023				
Year	**Min. No. Breeding Adults**	**Min. No. Breeding Males**	**No. Fledglings**	**No. Fledglings Per Breeding Male**
2002	32	18	35	1.94
2003	84	52	107	2.06
2004	121	67	66	0.99
2005	116	65	82	1.26
2006	107	58	17	0.29
2007	79	47	66	1.40
2008	95	54	72	1.33
2009	114	66	81	1.23
2010	137	78	107	1.37
2011	160	94	152	1.62
2012	190	105	96	0.91
2013	163	92	187	2.03
2014	226	120	196	1.63
2015	205	113	277	2.45
2016	209	110	157	1.43
2017	183	93	174	1.87
2018	201	115	200	1.74
2019	214	120	108	0.90
2020	190	110	117	1.06
2021	195	107	119	1.11
2022	206	119	179	1.50
2023	232	128	231	1.80
Average for all years (2002–23)	157	88	128	1.45
Average for 5-year period (2019–23)	207	117	151	1.28
Average for 3-year period (2021–23)	211	118	176	1.47

Note: The minimum number of breeding females is estimated from the maximum number of nests active on the same day, plus any additional nests hatching 1 day before or initiated 1 day after this date. From 2002 to 2008, the minimum number of breeding males was estimated from the highest same-day count of active nests and broods (males typically raise the chicks; males with broods 3 weeks of age or older are not included as they could be associated with a new nest). Beginning in 2009, all color-banded adults confirmed to be breeding were identified, and any individuals of this group that could not be accounted for on the same-day high count, including nests or broods with unknown adults, were added to the same-day high count for the appropriate sex. Source: (CDPR 2023b).

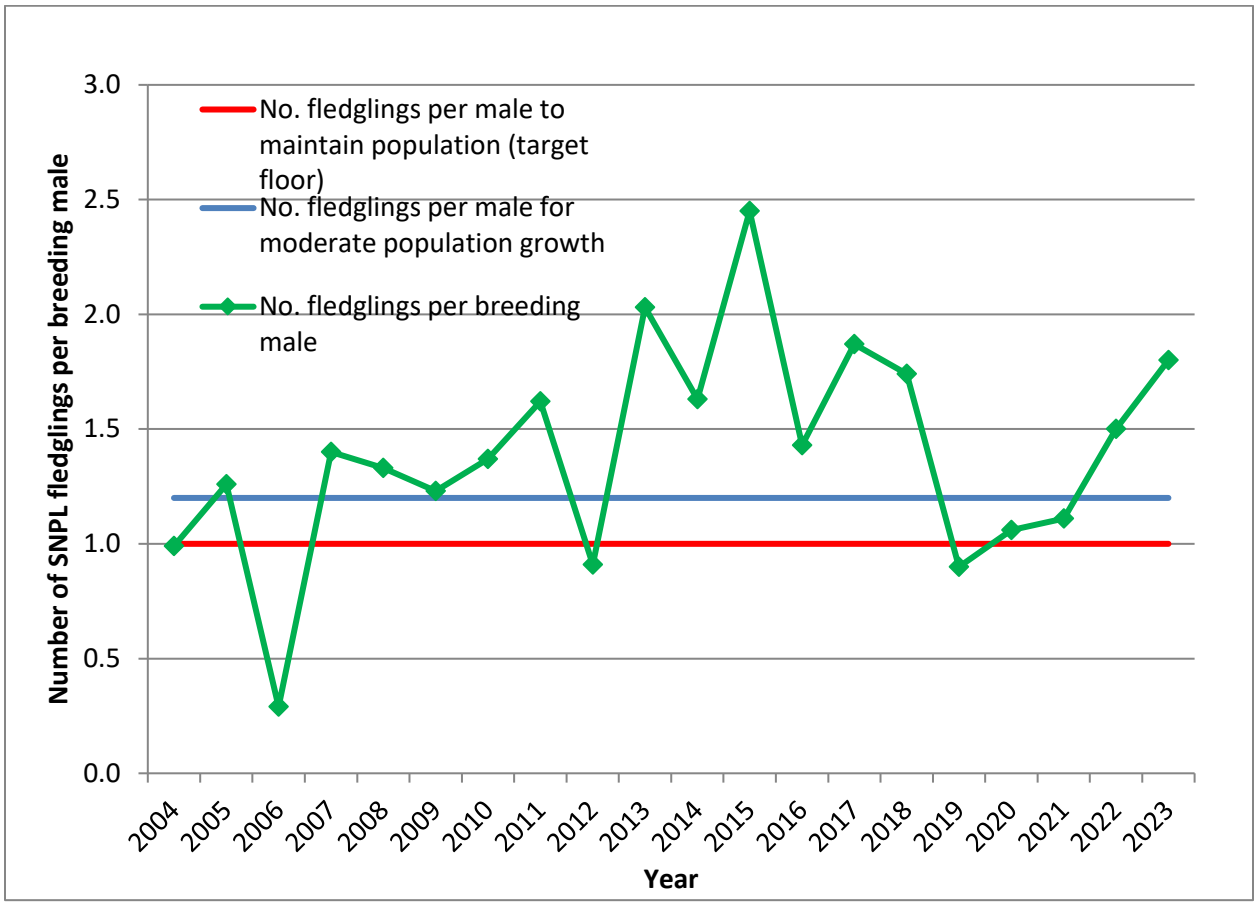


Figure 3-2. Number of SNPL fledglings per breeding male at Oceano Dunes District, 2002–2023.[37]

[37] 1.0 fledglings produced per male is necessary to prevent population decline, and 1.2 fledglings produced per male will result in population growth.

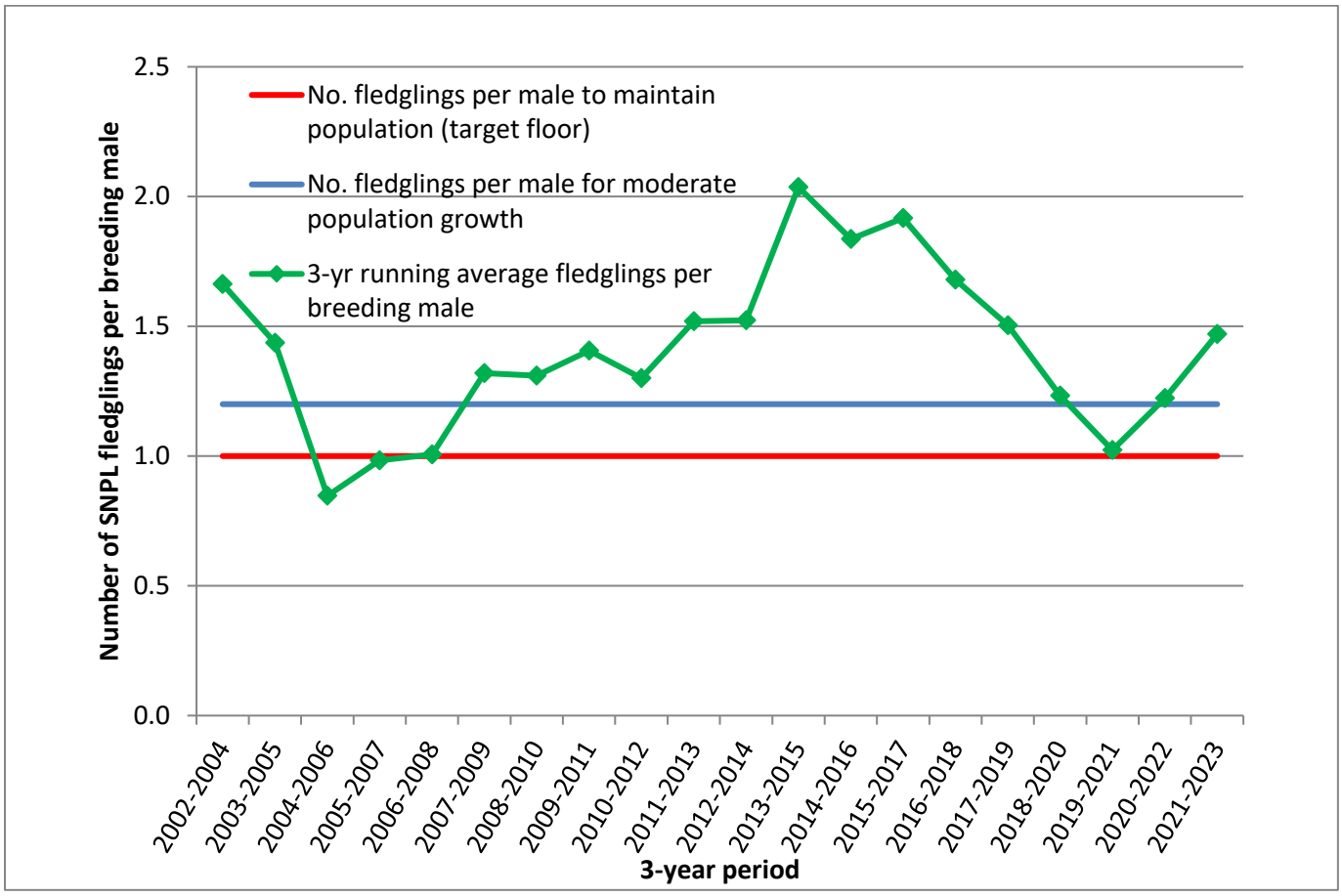


Figure 3-3. Three-year running average number of SNPL fledglings per breeding male at Oceano Dunes District.

3.3.2 California Least Tern (*Sternula antillarum browni*)

3.3.2.1 Regional Distribution and Abundance

The smallest of the North American terns, the CLTE is a colonial nesting seabird that nests along the Pacific Coast from Baja California to San Francisco Bay, California (Grinnell 1928, Small 1994, Thompson., et al. 1997, USFWS 2006) . Nesting also occurs sporadically at inland sites in the San Francisco Bay Delta and Central Valley (USFWS 2009a). Loss of habitat to development and recreation along with disturbance of nesting and feeding grounds has resulted in substantial declines in this subspecies following World War II (Atwood and Minsky 1983, Thompson., et al. 1997). Historically, CLTE nested on beaches, often near estuaries. Currently, nest sites are restricted to a few defined locations, some of which are artificial and most of which persist because of management (USFWS 2009a). From 1973 to 1975, the California breeding population was estimated at around 600 pairs (Bender 1973, Bender 1974, Massey 1975); by 2011 the estimated number of breeding pairs in California was 4,826–6,108 (Marschalek 2012). The CLTE has been designated as endangered under both CESA and FESA since 1976, and it is also a fully protected species under the California Fish and Game Code. The most recent USFWS 5-year review, completed in 2020, concluded with a recommendation of no change in listing status (USFWS 2020a).

3.3.2.2 Habitat Associations

CLTE often nest in habitats similar to those of SNPL, and there is often an overlap with the two species breeding on the same beach (USFWS 2007a). CLTE nesting colonies along the California coast are typically located on broad dune-backed sandy beaches or small sandspits where vegetation is either sparse or altogether absent (Map 12). CLTE forage primarily in near shore ocean waters and in shallow estuaries and lagoons (Massey 1988). At colonies where feeding activities have been studied, CLTE forage mostly within 2 miles of the breeding area and primarily in near shore ocean waters less than 60 feet deep (Atwood and Minsky 1983). CLTE feed on fish caught by diving into the surface waters of freshwater lakes, lagoons, and oceans.

Because of the documented movement of individual birds, the limits of colonies are difficult to define. Therefore, the USFWS views the CLTE population in terms of geographic "clusters" of sites rather than colonies (Massey and Fancher 1989, Fancher 1992). "Clusters" include several discrete nesting areas that are situated close to each other and where observations of banded birds suggest that movement among these areas are frequent (Atwood and Massey, Site Fidelity of the Least Terns in California 1988). The distance between neighboring "clusters" ranges from 30 to 180 miles (USFWS 2006). Within the central California coast, the CLTE is thought to be part of a geographic cluster that includes Oceano Dunes SVRA, Rancho Guadalupe County Park, Coal Oil Point Reserve, and VSFB. CLTE observed at Oceano Dunes SVRA, at the Santa Maria River mouth (i.e., Rancho Guadalupe County Park), and at VSFB in Santa Barbara County, California typically nest among the large open expanses of the beach and dunes that are completely or nearly completely devoid of vegetation. Nests may be found from within several feet of the shore to more than a mile inland. Nests are normally located in open areas where aerial and terrestrial predators can be detected at a distance. When threatened, adult CLTE will leave the nest and aggressively harass an intruder by mobbing, defecating, and vocalizing.

CLTE in and around the HCP area are most commonly observed foraging over the nearshore ocean waters, though they may also forage over nearby freshwater sources. In recent years they are occasionally seen foraging at Oso Flaco Lake, ponds of Monarch Dunes Golf Club (approximately 4.3 miles southeast of the CLTE colony), as well as the small lagoons that form at the mouth of Arroyo Grande Creek and Pismo Creek. In the past CLTE were observed foraging at Pismo Lake, Dune Lakes (approximately 1.0 to 1.5 miles inland from the site of the CLTE colony), Cypress Ridge Lake (approximately 3.2 miles from the site of the colony), and Santa Maria River mouth (approximately 5.5 miles south of the colony).

During the breeding season, adult CLTE not engaged in incubation or chick care may assemble in a communal night roost and are often joined by fledglings later in the breeding season. Reduced exposure to disturbance from predators is likely an important factor in the selection of a night roost location. CLTE exhibit a high degree of site fidelity, both within a breeding season and between years, with birds continuing to roost in the same location. Since at least 2004 and each year through 2019, adult and fledgling daytime roosting and loafing behavior in the HCP area has occurred primarily in the Southern Exclosure within 6 and 7 Exclosures or the protected adjacent shoreline. A night roost was first established outside of the Southern Exclosure in 2020 when the park was closed to vehicles. In 2021, the area east of 6 and 7 Exclosures was closed to visitor activity to provide large single-nest exclosures for CLTE nests, and the roost persisted within this closed area during the 2021 and 2022 seasons. In 2023, the night roost was east of 6 Exclosure within the large single-nest exclosure for the majority of the season and moved to within 6 Exclosure on a minimum of three occasions. Counts at the night roost are minimums, as some or all birds often arrive after it is too dark to count individuals. In 2023, there was a high count of 53 birds at the night roost on June 10 and June 24 (CDPR 2023). This compares to an average night roost high count of 62 (range=35-95) from 2007-22. Only adults were noted but it was

typically too dark to distinguish plumage and age class; see CDPR Oceano Dunes SVRA annual nesting season reports 2007-2023.

3.3.2.3 Breeding

In mid to late April, CLTE return to nesting grounds along the coast of California and Baja, Mexico. The breeding season lasts about 5 months, after which the birds migrate to wintering sites on the coasts of Central and South America (Thompson., et al. 1997).

CLTE usually choose a nesting location in an open expanse of sand, dirt, or dried mud, close to a lagoon or estuary with a dependable food supply (Massey 1974, USFWS 1985). CLTE normally scrape a small depression about 3.9 inches in diameter in sand or gravel where two or three eggs are incubated for 20–22 days (Anderson 1970, Massey 1974, Thompson., et al. 1997) . The semi-precocial chicks, which are capable of leaving the nest and hiding within a few days of hatching, are fed entirely on small fish brought by the parents. Fledging occurs 21–23 days after hatching, at which time the young birds may be led to a freshwater lake or slough, where the parents continue to provide food while the young birds learn to forage on their own (Thompson., et al. 1997).

3.3.2.4 Population Status in the HCP Area

CLTE first arrive in the HCP area from early April to mid-May and fully depart by late August to early September. As with SNPL, intensive monitoring of the breeding CLTE population in the HCP area provides valuable data for estimating the breeding population size and reproductive success. For CLTE, the number of breeding pairs is represented as a range. The single-day high count of concurrent nests and broods is used to determine the estimated minimum number of breeding pairs. The minimum number of pairs plus one-half of the value of the minimum number of pairs subtracted from the total number of nests (assumes nests in addition to those accounted for by the minimum number of pairs are equally divided between renesting pairs and new pairs) is used to determine the estimated maximum number of breeding pairs. CLTE chicks in the Oceano Dunes District were first banded in 2003, though determining fledging rate was difficult because the bands did not enable monitors to distinguish birds between broods. Starting in 2005, chicks were banded so each brood could be identified, and in 2006 each individual chick received a unique band combination. As a result, there has been a substantial increase in the opportunity to identify the number of active broods on a given date since 2005.

The number of CLTE nests that have been found within the HCP area has varied considerably from year to year and closely mirrors the number of breeding pairs (Table 3-10 and Figure 3-4). During the 21-year period from 2002 through 2022, an average of 47 nests per year were found. In 2023, 42 nesting attempts were documented (Table 3-10).

The majority of CLTE in the HCP area have nested within the Southern Exclosure since it was installed in 2003 and continuing through 2023. Use of the 6 and 7 Exclosures for nesting by CLTE has increased since the Southern Exclosure was expanded north to Post 6 in 2004. Since 2010, the majority of the CLTE nests have been within the 6 and 7 Exclosures, with 85 percent of nests being located in 7 Exclosure in 2019, 56 percent of the nests located in the 6 Exclosure in 2020, 67 percent of nests located in the 6 Exclosure in 2021, 71 percent of total nests located in the 6 Exclosure in 2022, and 71 percent of the total nests located in the 6 Exclosure in 2023. Conversely, since 2005 the percent of total nests at Oceano Dunes SVRA occurring in 8 Exclosure and Boneyard Exclosure has decreased from 69 percent in 2005 to 0 percent in 2010 to 2012, 2014, and 2017 to 2023. A single CLTE nest was located in the 8 Exclosure in both 2013 and 2015 (Table 3-10). In addition, three nests were located in the 8 Exclosure in 2016 (Table 3-10).

From 2005 through 2022, the average hatching rate for CLTE in the HCP area was 81 percent. In 2023, the hatching rate was 93 percent. There were 162 documented nest losses from 2002 to 2023 (nest

fates documented since 2002) due to abandonment (51 percent), predation (14 percent), wind (3 percent), and unknown cause (18 percent). Many nests failed from unknown cause are suspected to be due to predation. Abandonment may occur for a variety of reasons, including because eggs are not viable, adult associated with the nest is depredated, or nests are disturbed by humans and/or predators. Intensive efforts to protect nests from predators and human disturbance have been employed in the HCP area to improve the hatching success for CLTE.

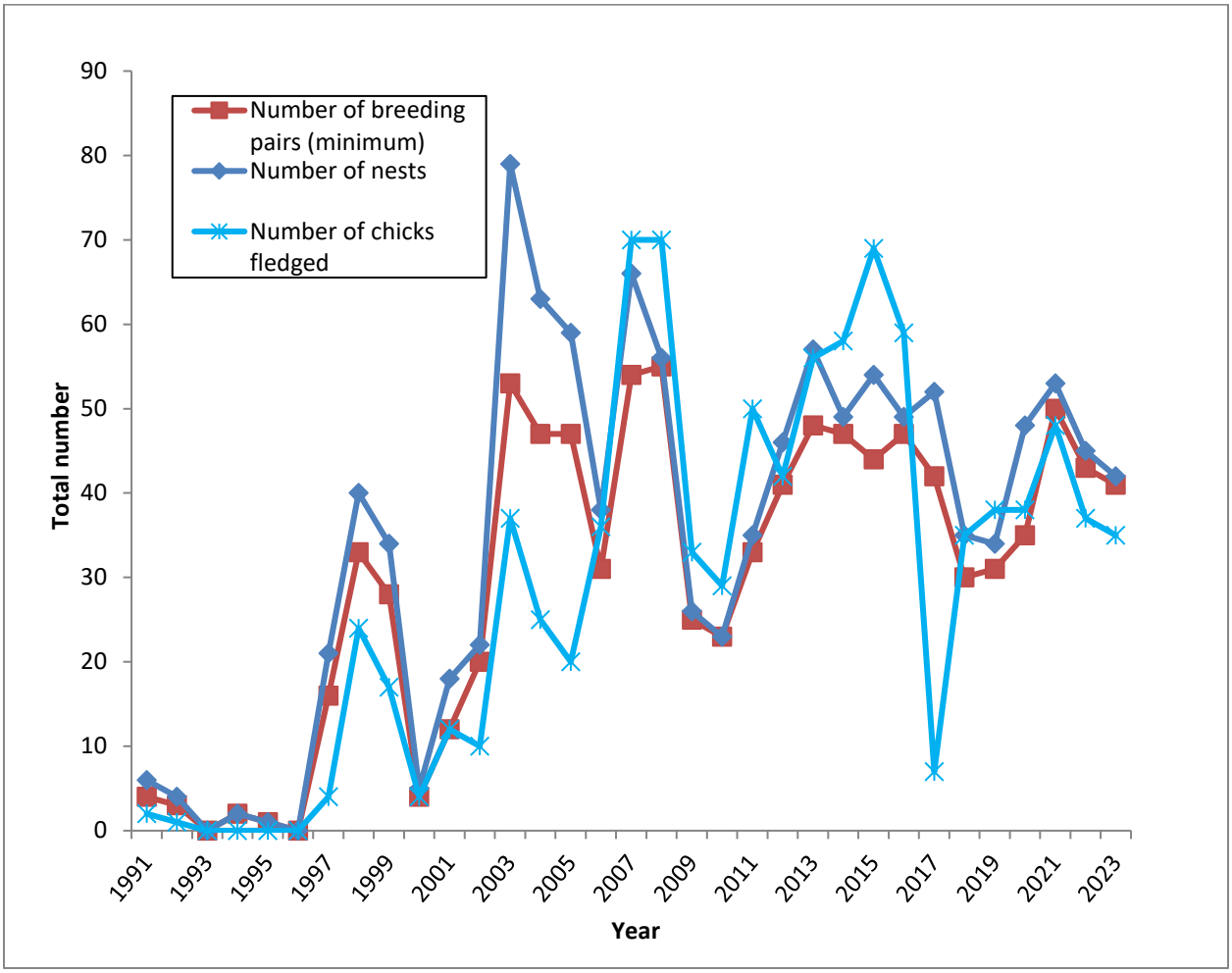


Figure 3-4. Number of CLTE breeding pairs, nests, and fledglings at Oceano Dunes District, 1991–2023.[38]

Protection from predators and human disturbance appears to have improved fledging rates. Fledging rates in the HCP area have been relatively high since 2006, exceeding 65 percent annually from 2006 through 2016; however, in 2017 the fledging rate was exceptionally low at 18 percent (Table 3-10). In 2018, the fledging rate increased again to 83 percent and ranged from 53 to 73 percent from 2019-2023. From 2006 through 2016 and 2018 to 2019, the number of juveniles fledged per pair exceeded 1.0 each year; however, in 2017 the number of juveniles fledged per pair was well below 1.0, and from 2020 to 2023, the minimum juveniles fledged per pair ranged from 0.83 to 0.92 (Table 3-10).

[38] Source: (CDPR 2017a)

The statewide average CLTE fledglings per breeding pair for the 18-year period 2005 to 2022 was 0.25-0.37 compared to the average fledge rate of 1.08-1.15 per pair in the HCP area over the same time period (Table 3-11). Overall, the number of chicks fledged closely reflects the number of breeding pairs in the HCP area (Figure 3-4), which suggests that the best way to maximize total reproductive output is to manage habitat to support a large breeding population and to protect nests and chicks to maximize the fledging rate.

3.3.2.5 Importance of the Oceano Dunes District Least Tern Breeding Colony

The CLTE breeding colony in the HCP area, primarily the SVRA, has benefited from the increased level of protection and management actions provided since 2002. The colony is important in meeting statewide recovery goals as loss of breeding habitat has resulted in a fragmented population distribution and a limited number of remaining breeding populations (USFWS 1985, California Least Tern (Sternula antillarum browni) 5-Year Review Summary and Evaluation. 2006). On a regional level, very few active breeding sites exist along the central coast of California, and none remain between Oceano Dunes SVRA and San Francisco Bay. Within San Luis Obispo and Santa Barbara counties there are four CLTE colony sites, all with management providing protective measures. Oceano Dunes SVRA is the only site in San Luis Obispo County. Rancho Guadalupe Dunes County Park, VSFB, and Coal Oil Point Reserve are in Santa Barbara County and approximately 7, 22, and 85 miles south of the Oceano Dunes SVRA colony, respectively. The CLTE at Oceano Dunes SVRA represent a significant component of this regional population. From 2004 to 2023, numbers of breeding CLTE at Oceano Dunes SVRA varied from 23 to 60 pairs compared with the total from other aforementioned sites, which ranged from 7 to 71 pairs (Table 3-12). Oceano Dunes SVRA also has become an important source of productivity for this regional population. During the period 2004–2023, Oceano Dunes SVRA produced a minimum of 856 juvenile CLTE while Rancho Guadalupe Dunes County Park, VSFB, and Coal Oil Point Reserve combined produced an estimated maximum of 347 juveniles Table 3-12.

3.3.2.6 Regulatory Status and Recovery Plan

In addition to being listed as endangered under both FESA and CESA, the CLTE is also a California fully protected species. The USFWS has not designated critical habitat for the species, but the USFWS did finalize the revised Recovery Plan for the CLTE in 1985 (USFWS 1985). The Recovery Plan identified the following delisting criteria for CLTE:

- Maintain at least 1,200 breeding pairs distributed in at least 20 of 23 coastal management areas
- Each of the 20 “secure” coastal management areas must have at least 20 breeding pairs
- Each of the 20 “secure” coastal management areas must have a 5-year mean reproductive rate of at least 1.0 young fledged per breeding pair
- San Francisco Bay, Mission Bay, and San Diego Bay must be included within the 20 secure management areas with 4, 6, and 6 secure colonies, respectively

The 2006 USFWS 5-year review, however, recommended revising the current Recovery Plan because “current estimates of population and productivity necessary for downlisting and delisting may not be practicable or applicable, per advances in tern ecology, habitat management, and population viability analysis” (USFWS 2006). For example, the 1985 recovery criteria do not explicitly address specific threats to CLTE. Also, the 5-Year Review noted data on reproduction and population size suggested that a rate less than 1.0 young fledged per breeding pair appeared to have been adequate for population growth. The most recent USFWS 5-year review also recommended revisiting and revising the current CLTE recovery plan, and also recommended continuing to work with CDPR and other partners to continue

current successful site management that minimizing impacts of encroaching vegetation, predation, and human disturbance (USFWS 2020a).

The resource protection strategies employed by CDPR that will be continued under this HCP will ensure continued management and monitoring of CLTE at Oceano Dunes SVRA. The ongoing CLTE management program at Oceano Dunes SVRA has been successful as measured by the delisting criteria listed above: from 2005 to 2023 the average annual number of breeding pairs was 40 to 43, and from 2005 to 2023, the average number of juveniles fledged per pair was 1.03 to 1.1.

3.3.2.7 HCP Area Conservation Program

CDPR currently manages the CLTE conservation program presented in this HCP to optimize breeding success and reduce potential impacts to CLTE in the HCP area. The conservation program includes such actions as seasonally closing areas to visitors and installing fence and signage around these areas to delineate them; augmenting existing habitat with branches and woodchips; and implementing a predator management program. Over the years, CDPR has worked with CDFW and USFWS to modify the conservation program and respond to potential impacts to CLTE. For example, daily monitoring in the open riding area began in 2001, the predator management program began in 2002, night roost monitoring began in 2004 and night-vision equipment was used to monitor the night roost starting in 2009, and the minimum distance between CLTE nests and open riding area was increased in 2016 and 2021. In 2000, prior to daily monitoring and other activities associated with the conservation program, only five nests were located in the HCP area, and only four chicks fledged. Starting in 2002, 1 year after daily monitoring began in the open riding area and more regular monitoring began in other portions of the HCP area, 22 nests were located in the HCP area and 10 chicks fledged. Starting in 2003, 1 year after predator management began, 79 nests were located in the HCP area, and 37 chicks fledged. Since 2004, the number of nests has varied between 23 and 66, and the number of chicks fledged has varied between 7 and 70 (Table 3-10). Overall, breeding success for CLTE in the HCP area has increased, and this is likely due in large part to CDPR's efforts towards the conservation program.

3.3.2.8 Suitable Habitat in the HCP Area

CLTE nests in the HCP area are typically found in the Southern Exclosure during the breeding season (Map 13). Specifically, CLTE nests have been found in the 6 Exclosure, 7 Exclosure, and 8 Exclosure. CLTE nests have also been found in the Boneyard Exclosure and the open riding area. In addition, the CLTE night roost has been located in both the 6 Exclosure and 7 Exclosure in the past, and more recently east of 6 and 7 Exclosures within large single-nest exclosures. The HCP area, however, contains additional suitable habitat for CLTE. This section describes habitat available for CLTE in the HCP area.

CLTE terrestrial habitat was mapped using the same criteria as SNPL (section 3.3.1.8), as CLTE generally have similar habitat requirements for nesting and roosting in dune-backed coastal habitats in the region (Map 12). However, habitat used by SNPL for foraging is not used for foraging by CLTE. CLTE forage for fish by diving into the surface waters of freshwater lakes and rivers and oceans. Therefore, all suitable aquatic habitats (e.g., ocean and lakes) were mapped as foraging habitat.

In total, 4,513 acres were mapped as suitable CLTE terrestrial habitat in the HCP area: 698 acres of primary habitat, 250 acres of secondary habitat, and 3,565 acres of tertiary habitat. An additional 80 acres of aquatic habitat were mapped as suitable foraging habitat. For the period from 2005 to 2023, virtually all of the observed CLTE nests occurred in primary habitat (greater than 99 percent) (Table 3-9). This result is expected as most of the CLTE nesting in the HCP area nest within the Southern Exclosure, which is placed mostly within primary habitat.

Table 3-9. Number of CLTE Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 13)

Year	Nests in Primary Habitat	Nests in Secondary Habitat	Nests in Tertiary Habitat
2005	58	0	0
2006	38	0	0
2007	63	2	0
2008	55	0	0
2009	26	0	0
2010	23	0	0
2011	35	0	0
2012	46	0	0
2013	56	0	0
2014	49	0	0
2015	54	0	0
2016	48	0	0
2017	52	0	0
2018	36	0	0
2019	34	0	0
2020[1]	47	1[1]	0
2021	52	0	0
2022	45	0	0
2023	42	0	0
Total	859	3	0

[1]Park was closed to campers/riders due to Covid restrictions.

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2001	8 Exclosure	–	14	28	11 (79)	18	–	–	–
	Boneyard Exclosure	–	4	7	2 (50)	3	–	–	–
	Total	**12–15**	**18 (18)**	**35**	**13[2] (72)**	**22[3]**	**12[4] (55)**	**0.67[4]**	**0.80–1.00**
2002	7/8 Exclosures	–	17 (14)[5]	34	11	19	–	–	–
	Boneyard Exclosure	–	5	10	4	8	–	–	–
	Total	**20–21**	**22 (19)**	**44**	**15[6] (79)**	**27**	**10 (37)**	**0.53**	**0.48–0.50**
2003	7 Exclosure	–	26	44	19 (73)	29	–	–	–
	8 Exclosure	–	47	80	36 (77)	63	–	–	–
	Boneyard Exclosure	–	6	11	5 (83)	9	–	–	–
	Total	**53–66**	**79 (77)**	**135**	**60[7] (78)**	**101**	**37 (37)**	**0.48[8]**	**0.56–0.70**
2004	7 Exclosure	–	14	26	10 (71)	16	–	–	–
	8 Exclosure	–	40	64	25 (63)	40	–	–	–
	Boneyard Exclosure	–	7	12	7 (100)	10	–	–	–
	Southern Exclosure Total	–	61	102	42 (69)	66	–	–	–
	Uncertain location	–	1	1	1 (100)	1	–	–	–
	Open riding area	–	1[9]	2	1 (100)	2	–	–	–
	Total	**47–55**	**63 (60)**	**105**	**44 (73)**	**69**	**25 (36)**	**0.42**	**0.45–0.53**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2005	6 Exclosure	–	4	7	4 (100)	7	5 (71)	1.25	–
	7 Exclosure	–	13	25	10 (77)	18	7 (39)	0.54	–
	8 Exclosure	–	31	53	17 (55)	28	6 (21)	0.19	–
	Boneyard Exclosure	–	10	16	7 (70)	11	0 (0)	0.00	–
	Southern Exclosure Total	–	58	101	38 (66)	64	18 (28)	0.31	–
	Open riding area	–	1[10]	2	1 (100)	2	2 (100)	2.00	–
	Total	**47–53**	**59 (59)**	**103**	**39 (66)**	**66**	**20 (30)**	**0.34**	**0.38–0.43**
2006	6 Exclosure	–	20	31	14 (70)	21	16 (76)	0.80	–
	7 Exclosure	–	6	9	5 (83)	8	8 (100)	1.33	–
	8 Exclosure	–	12	20	9 (75)	16	12 (75)	1.00	–
	Total	**31–35**	**38 (38)**	**60**	**28 (74)**	**45**	**36 (80)**	**0.95**	**1.03–1.16**
2007	6 Exclosure	–	25	46	20 (80)	33	29 (88)	1.16	–
	7 Exclosure	–	28[11]	48	22 (79)	40	28 (70)	1.00	–
	8 Exclosure	–	9	18	5 (56)	10	4 (40)	0.44	–
	Boneyard Exclosure	–	4	8	4 (100)	7	7 (100)	1.75	–
	Unknown nest identity	–	0	–	–	–	2 (–)	–	–
	Total	**54–60**	**66 (66)**	**120**	**51 (77)**	**90**	**70 (78)**	**1.06**	**1.17–1.30**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2008	6 Exclosure	–	32	67	28 (88)	57	38 (67)	1.19	–
	7 Exclosure	–	13[12]	26	12 (92)	23	16 (70)	1.23	–
	8 Exclosure	–	10	20	9 (90)	17	11 (65)	1.10	–
	Boneyard Exclosure	–	1	2	1 (100)	2	2 (100)	2.00	–
	Unknown nest identity	–	–	–	–	–	3 (–)	–	–
	Total	**55–56**	**56 (56)**	**115**	**50 (89)**	**99**	**70 (71)**	**1.25**	**1.25–1.27**
2009	6 Exclosure	–	20	Min. 40	17 (85)	32	23–27 (72–84)	1.15–1.35	–
	7 Exclosure	–	3	6	3 (100)	6	5 (83)	1.67	–
	8 Exclosure	–	2	3	2 (100)	3	0 (0)	–	–
	Boneyard Exclosure	–	1	2	1 (100)	2	1 (50)	1.00	–
	Total	**25–26**	**26 (26)**	**Min. 51**	**23 (88)**	**43[13]**	**29–33 (67–77)[14]**	**1.16–1.32[14]**	**1.27–1.32**
2010	6 Exclosure	–	20	39	18 (90)	32	26 (81)	1.30	–
	7 Exclosure	–	3	6	2 (67)	3	3 (100)	1.00	–
	8 Exclosure	–	0	0	0 (–)	0	0 (-)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (-)	–	–
	Total	**23**	**23 (23)**	**45**	**20 (87)**	**35**	**29 (83)[15]**	**1.26**	**1.26**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2011	6 Exclosure	–	26	47	22 (85)	38	37 (97)	1.42	–
	7 Exclosure	–	9	18	9 (100)	17	13 (77)	1.44	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	–	–
	Total	**33–34**	**35 (35)**	**65**	**31 (89)**	**55**	**50 (91)**	**1.43**	**1.47–1.52**
2012	6 Exclosure	–	36	62	26 (87)	41	33 (81)	1.10	–
	7 Exclosure	–	10	19	6 (67)	10	8 (80)	0.89	–
	8 Exclosure	–	0	0	0 (–)	0	0 (-)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	–	–
	Total	**41–44**	**46 (40)**	**82**	**33 (83)**	**52**	**42 (81)**	**1.05**	**0.95–1.02**
2013	6 Exclosure	–	39	74	36 (97)	65	45[16] (69.2)	–	–
	7 Exclosure	–	17	32	8 (57)	17	7 (41.2)	–	–
	8 Exclosure	–	1	3	1 (100)	3	0 (–)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**48–53**	**57 (52)**	**109**	**45 (87)**	**85**	**56 (66)**	**1.08**	**1.06–1.17**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2014	6 Exclosure	–	37 (36)	71	33 (92)	60	–	–	–
	7 Exclosure	–	12 (10)	24	9 (90)	16	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**47–48**	**49 (46)**	**95**	**42 (91)**	**76**	**58 (76)**	**1.26**	**1.21–1.23**
2015	6 Exclosure	–	38 (38)	71	35 (92)	61	–	–	–
	7 Exclosure	–	15 (15)	25	12 (80)	21	–	–	–
	8 Exclosure	–	1 (1)	2	1 (100)	2	–	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**44–49**	**54 (54)**	**98**	**48 (89)**	**84**	**69 (82)**	**1.28**	**1.41–1.57**
2016	6 Exclosure	–	26 (25)	52	25 (100)	43	–	–	–
	7 Exclosure	–	20 (19)	38	18 (95)	29	–	–	–
	8 Exclosure	–	3 (3)	6	3 (100)	6	–	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**47–48**	**49 (47)**	**96**	**46 (98)**	**78**	**59 (76)**	**1.26**	**1.23–1.26**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2017	6 Exclosure	–	26 (19)	40	11 (58)	18	–	–	–
	7 Exclosure	–	26 (15)	42	11 (73)	21	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**42–47**	**52 (34)**	**82**	**22 (65)**	**39**	**7 (18)**	**0.13**	**0.15–0.17**
2018	6 Exclosure	–	20 (20)	–	14 (70)	31	–	–	–
	7 Exclosure	–	15 (15)	–	14 (93)	20	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**30–33**	**35 (35)**	**52**	**28 (80)**	**42**	**35 (83)**	**1.00**	**1.06–1.17**
2019	6 Exclosure	–	5 (5)	11	5 (100)	10	–	–	–
	7 Exclosure	–	29 (28)	48	26 (93)	42	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**31-33**	**34 (33)**	**59**	**31 (94)**	**52**	**38 (73)**	**1.12**	**1.15-1.23**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2020	6 Exclosure	–	27 (25)	53	19 (76)	34	–	–	–
	7 Exclosure	–	20 (20)	34	16 (80)	27	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Southern Exclosure Total	–	47 (45)	87	35 (78)	61	–	–	–
	Open Riding Area[17]	–	1 (1)	2	1 (100)	2	–	–	–
	Total	**35-42**	**48 (46)**	**89**	**36 (78)**	**63**	**38 (60)**	**0.79**	**0.90-1.09**
2021	6 Exclosure	–	35 (35)	62	34 (97)	56	–	–	–
	7 Exclosure	–	17 (16)	31	14 (88)	23	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Unknown Location	–	1 (1)	–	1	2	–	–	–
	Total	**50-52**	**53 (51)**	**93**	**49 (94)**	**81**	**48 (59)**	**0.91**	**0.92-0.96**
2022	6 Exclosure	–	32 (31)	62	29 (94)	50	–	–	–
	7 Exclosure	–	13 (13)	23	13 (100)	19	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**43-44**	**45 (44)**	**85**	**42 (95)**	**69**	**37 (54)**	**0.82**	**0.84-0.86**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2023	6 Exclosure	–	30 (29)	56	27 (93)	49	–	–	–
	7 Exclosure	–	12 (11)	24	10 (91)	17	–	–	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**41-42**	**42 (40)**	**80**	**37 (93)**	**66**	**35 (53)**	**0.83**	**0.83-0.85**

– = Data not available

Notes:

[1]The method for estimating the number of fledglings has varied among years: single-day high count for 2001; 3-week-interval day count conducted from 2002 to 2004 (chicks banded to site in 2003 and 2004); chicks were color-banded to brood in 2005 and to individual since 2006, resulting in more accurate documentation of fledge rate than previous methods. Estimates of fledging rates prior to 2005 are less accurate and may represent substantial under-counts or over-counts; therefore, comparisons of annual fledging rates before 2005 may be unreliable.

[2] It was not determined whether four nests hatched or failed.

[3] The number of chicks from one known-hatch nest was not determined.

[4] Chicks were not banded; therefore, accurate estimates of fledging rates are not available.

[5] The location was not identified for the three nests whose fate (hatched or failed) was not determined. For accounting purposes, the three nests were categorized as having occurred in 7 and 8 Exclosures.

[6] It was not determined if three nests hatched or failed.

[7] It was not determined if two nests hatched or failed.

[8] Chicks were banded, but not to brood; therefore, fledge rates are estimates.

[9] Nest located just outside the Southern Exclosure northeast of Post 8.

[10] Nest located on the beach near Arroyo Grande Creek in an area open to pedestrians, equestrians, and street-legal vehicles.

[11] One nest known only from detection of small chicks being brooded in 7 Exclosure, the nest was assumed to have been in 7 Exclosure for purpose of calculation.

[12] One nest known only from detection of very small chicks being brooded (and banded) in 7 Exclosure, nest was assumed to have been in 7 Exclosure.

[13] Six chicks were unbanded and four of these were identified as fledging and are included.

[14] The number of chicks fledged and juveniles fledged per nest are reported as a range, with 29 banded chicks confirmed fledging and an additional four unbanded chicks likely fledging.

[15] One chick was unbanded and identified as fledging and is included.

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2023

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair

[16] Four unbanded fledglings were seen in 6 Exclosure on July 28. These four unbanded fledglings were not assigned to specific nests and are not included in this table.

[17] In 2020, the SVRA was closed to public vehicle use and camping on March 28 and remained closed for the CLTE nesting season. Prior to 2020, the last CLTE nest found outside of the Southern Exclosure was one nest at Arroyo Grande Creek area in 2005.

Sources: CDPR (2001a), Henkel (2001), George (2002, 2003), and CDPR Annual CLTE and SNPL Nesting Season Reports, CDPR (2004) through (2023).

Table 3-11. Number of CLTE Chicks Fledged Per Pair in the HCP Area and Statewide, 2006–2023

Year	HCP Area	Statewide*
2006	1.03-1.16	0.35–0.52
2007	1.17-1.30	0.33–0.39
2008	1.27-1.29	0.29–0.37
2009	1.27-1.32	0.24–0.30
2010	1.26-1.26	0.29–0.35
2011	1.47-1.52	0.17–0.25
2012	0.95-1.02	0.09–0.15
2013	1.06-1.17	0.25–0.38
2014	1.21-1.23	0.37–0.68
2015	1.41-1.57	0.29–0.45
2016	1.23-1.26	0.35–0.50
2017	0.15-0.17	0.2–0.4
2018	1.06-1.17	0.19–0.30
2019	1.15-1.23	0.18–0.30
2020	0.90-1.09	0.22–0.37
2021	0.92-0.96	0.18–0.30
2022	0.84-0.86	0.18-0.23
2023	0.83-0.85	n/a
Avg. 2005-2022	1.08-1.15	0.25-0.37

*The statewide number is presented with a minimum and maximum range of CLTE chicks fledged per pair.

Sources: (Marschalek 2007, 2008, 2009, 2010, 2011, 2012), (Frost 2013, 2014, 2016, 2017) (Sin, CDFW, Nongame Wildlife Program 2021, Sin, Clatterbuck and Rice 2024)

Table 3-12. Number of Reported Breeding CLTE Pairs and Juveniles Produced at Oceano Dunes SVRA and the Combined Sites of Rancho Guadalupe Dunes County Park (RGDCP), Vandenberg Space Force Base (VSFB), and Coal Oil Point Reserve (COPR), 2004–2023

	Oceano Dunes SVRA		RGDCP, VSFB, and COPR combined	
Year	Number of Breeding Pairs	Number of Juveniles	Number of Breeding Pairs	Number of Juveniles
2004	47–55	25	15	0
2005	47–53	20	48	1
2006	31–35	36	7	7
2007	54–60	70	23	17
2008	55–56	71	19	19

Table 3-12. Number of Reported Breeding CLTE Pairs and Juveniles Produced at Oceano Dunes SVRA and the Combined Sites of Rancho Guadalupe Dunes County Park (RGDCP), Vandenberg Space Force Base (VSFB), and Coal Oil Point Reserve (COPR), 2004–2023

	Oceano Dunes SVRA		RGDCP, VSFB, and COPR combined	
Year	Number of Breeding Pairs	Number of Juveniles	Number of Breeding Pairs	Number of Juveniles
2009	25–26	33	32–33	40
2010	23	29	34	31
2011	33–34	50	33	4
2012	41–44	42	18	10
2013	48–53	56	15	19
2014	47–48	58	17	20
2015	44–49	69	22	29
2016	47–48	59	25	18
2017	42–47	7	27	8
2018	30–33	35	70–71	39
2019	31-33	38	59	211
2020	35-42	38	60	11-16
2021	50-52	48	27	8
2022	43-44	37	43	23
2023	41-42	35	39	17
	Total Juveniles Produced	**856**	**Total Juveniles Produced**	**342-347[1]**

[1]In 2019, RGDP had at least 17 nests hatch a minimum of 15 chicks and the number of juveniles produced is unknown.

Note: Almost all CLTE chicks are banded at Oceano Dunes SVRA, and observation of color-bands is the primary means to document juvenile production. VSFB began banding tern chicks in 2018 to site and year. Banding does not occur at the other sites, and other methods are used to estimate the number of juveniles produced.

Source: (CDPR 2023)

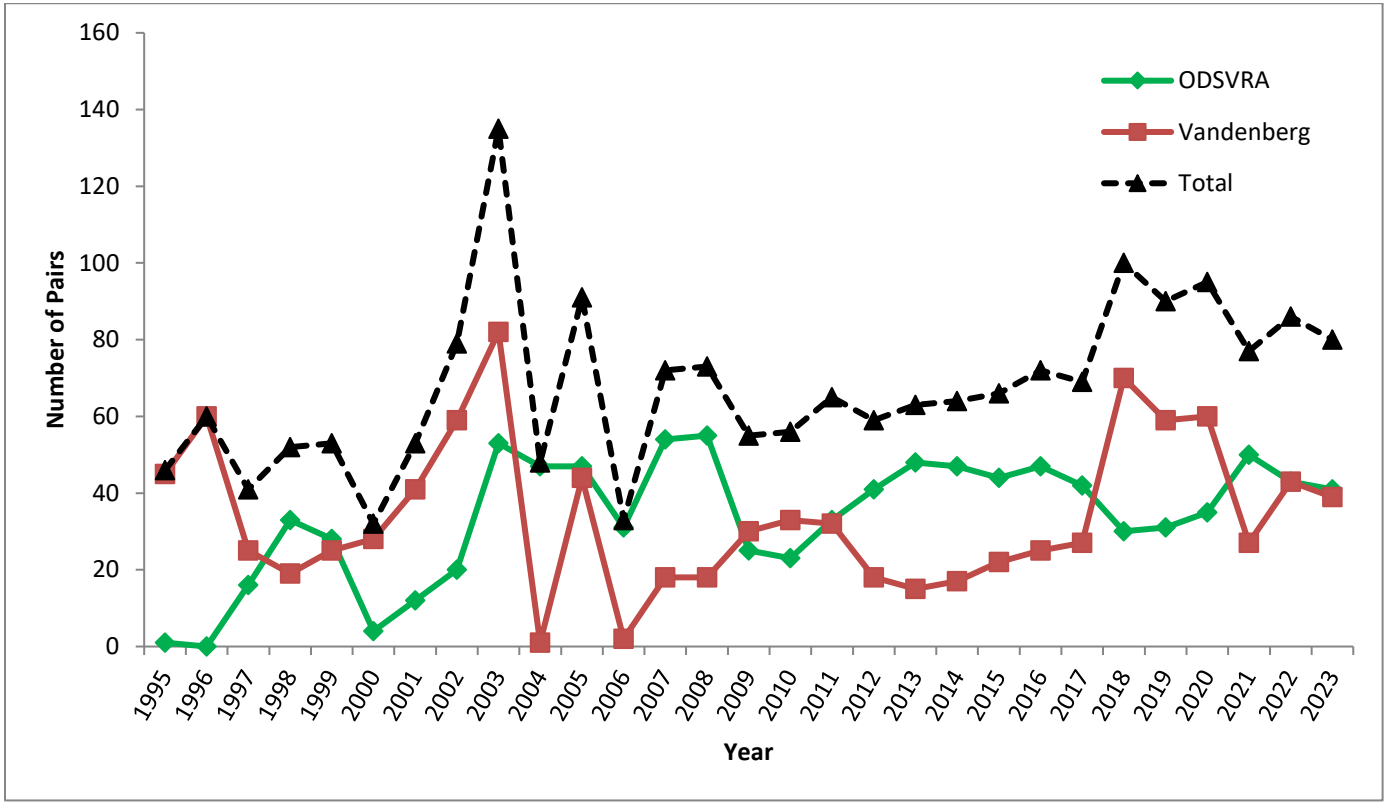


Figure 3-5. Estimated number of breeding pairs of CLTE at Oceano Dunes SVRA and Vandenberg Space Force Base, 1995–2023.



Figure 3-6. Five-year running average of breeding pairs of CLTE at Oceano Dunes SVRA.

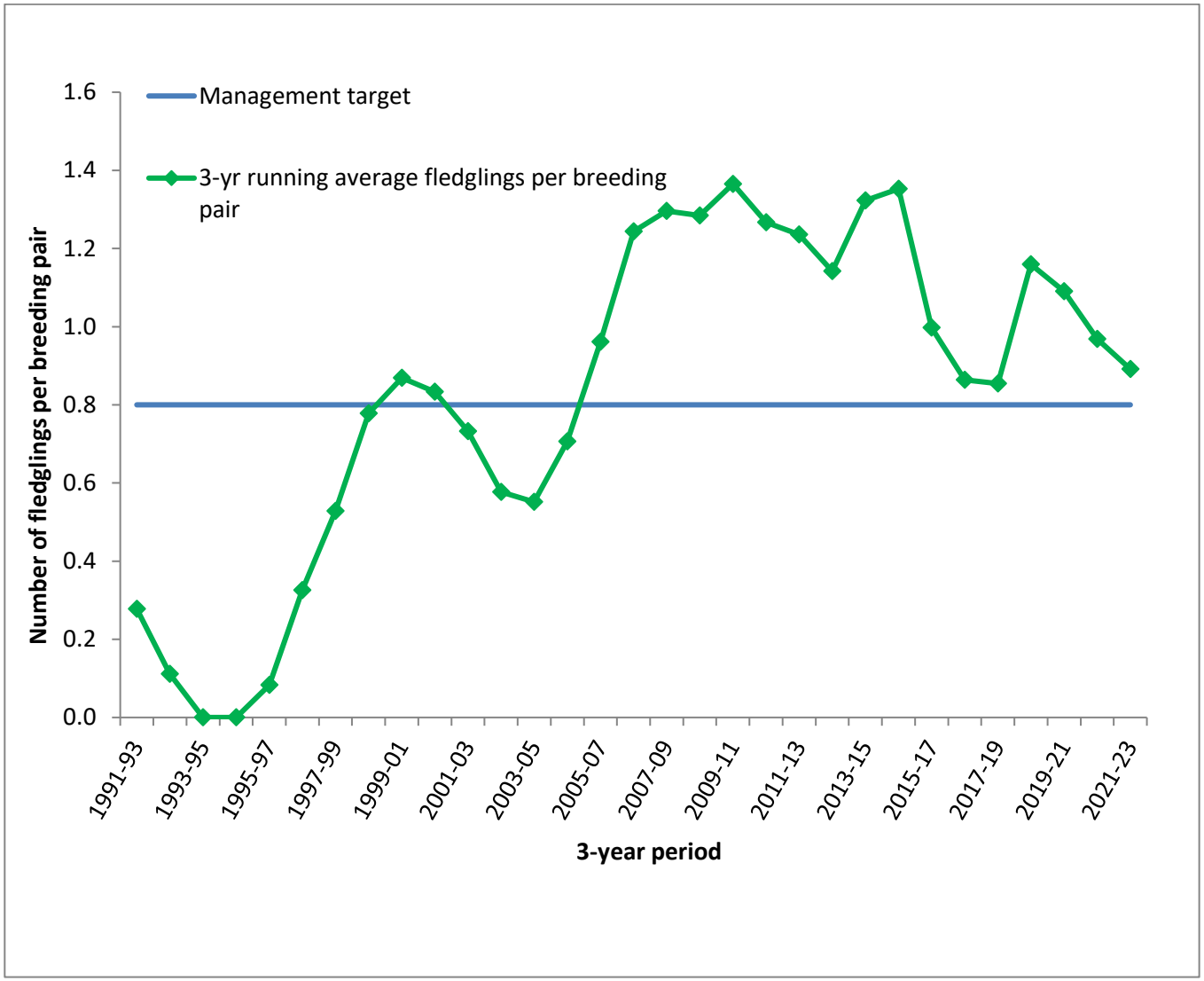


Figure 3-7. Three-year running average of fledglings per breeding pair of CLTE at Oceano Dunes SVRA.

3.3.3 Southwestern Pond Turtle (*Actinemys pallida*)

3.3.3.1 Regional Distribution and Abundance

A semi-aquatic turtle of medium size (USFWS 2023a), southwestern pond turtle (SWPT) adults in one long-term study ranged from 109 to 179 mm long in carapace length and weighed approximately 194 to 828 grams (Germano and Riedle 2015). The species may occur from sea level to approximately 2000 meters (6,600 feet) in elevation (Germano 2023). This species is relatively long-lived, with the average lifespan expected to be approximately 25 years, but individuals upwards of 40-55 years of age have been observed (USFWS 2023a, Holland 1994, Bury, et al. 2012).

The SWPT was previously lumped into a single species along with the northwestern pond turtle (as *Actinemys marmorata* or NWPT) and is now recognized as a separate species. Morphological divergence from NWPT and SWPT was described in 1945 by L.M. Seeliger, which led to recognition at the subspecies rank, and was later confirmed by molecular evidence but recognized at the species rank (Spinks, Thomson and Shaffer 2014). In general, specimens of SWPT have yellow neck sides with brown markings and extremely small inguinal scutes or none, while the NWPT has dark spots or lines over brown or grey neck sides and large inguinal scutes (a bony plate on the turtle's shell near the hind legs). Seeliger (1945) also noted that there is some variability in these characteristics and intergrades where the northwestern and southwestern pond turtles meet. Spinks et al. (2014) posited that the Baja California populations may be a separate species; however, this requires further analysis.

SWPT populations are known to be declining across their range and have been recognized as a species of special concern in California (Manzo et al. 2021). USFWS has proposed listing SWPT as a threatened species under FESA (USFWS 2023c)**.** The species is distributed along the west coast and Inter Coastal Range from Baja California to the Monterey Bay area of California (Shaffer, et al. 2019). The historical distribution of SWPT is believed to have been larger than the current distribution, with population declines being attributed to habitat loss, habitat fragmentation, drought, and predation by animals (e.g., bass, raptors, canids, bears, raccoons, etc.) in many literature accounts (Reese 1996, Madden-Smith, et al. 2005, Holland 1994, USFWS 2023a). Bullfrog predation has been one of the largest threats attributed to the decline in populations of SWPT by multiple scientists studying SWPT (Nicholson, et al. 2020, Manzo, et al. 2021), Madden-Smith et al. 2005, Reese 1996, Holland 1994, USFWS 2023, Department of Defense 2023).

3.3.3.2 Habitat Associations

The western pond turtle exhibits a dependence on both aquatic and terrestrial habitats for various aspects of its life cycle (Department of Defense 2020). This semi-aquatic species demonstrates broad ecological adaptability, persisting in a variety of freshwater lentic (standing water) and lotic (flowing water) systems throughout its range (Holland 1994). Studies have documented their presence in permanent and ephemeral rivers, streams, ponds, lakes, marshes, irrigation ditches, and even reservoirs (USFWS 2023). While demonstrably capable of navigating fast-moving currents (Germano 2016), adult western pond turtles also require areas of lentic waters for foraging and refuge, and underwater cover objects such as logs, rocks, and aquatic vegetation is often associated with these turtles (Jennings and Hayes 1994).

Basking behavior is another crucial aspect of their ecology for thermoregulation, and suitable basking sites near the water's edge are essential. Turtles will typically bask when water temperatures are low or lower than air temperatures, and will lie in surface waters during hotter temperatures, often even seeking microclimates with appropriate temperatures such as thermal gradients or under vegetation to optimize thermoregulation (Holland 1994). The SWPT will bask on a variety of substrates ranging from bedrock to sand and mud (Holland 1994), and it is noted that this species has been found in highly

disturbed aquatic associations such as aqueducts (Germano 2016) and wastewater treatment ponds (USFWS 2023a). Holland (1994) noted that this species tends to avoid water courses with little to no adjacent vegetation. Uplands serve various purposes for these turtles, including nesting, brumation/overwintering (a state of dormancy similar to hibernation), refuge from predators, basking, and dispersal for both juveniles and adults.

All mobile life stages of the SWPT, from hatchlings to adults, exhibit a strong dependence on aquatic habitats. This highlights the importance of maintaining connectivity and suitable conditions across terrestrial and aquatic environments for their long-term survival. Foraging occurs underwater only, by sign and smell, and turtles may forage up to an hour or more underwater seeking food (Holland 1994). SWPT are omnivorous, and food sources include aquatic plants, aquatic invertebrates, eggs, small vertebrates, larvae, crustaceans and annelids (worms). Aquatic vegetation and slow-moving water is particularly significant for juvenile turtles (Department of Defense 2020) as it provides a more sheltered environment that facilitates development and affords protection during the crucial phase of swimming skill acquisition (USFWS 2023). As western pond turtles mature, they exhibit a greater tolerance for a wider range of aquatic conditions, potentially reflecting a decreased vulnerability to predation as their body size and swimming abilities increase (Department of Defense 2020).

3.3.3.3 Breeding and Migration

The SWPT is oviparous (egg-laying) with a clutch size that varies depending on the female's body size and health, but they typically lay between 2 and 10 eggs per clutch (Holland 1994). Females may produce multiple clutches within a single year, with nesting typically occurring between May and July (Rathbun et al. 1993).

The SWPT does not exhibit extensive migrations. Most movements are often driven by factors such as water temperature, food availability, and nesting site selection (Holland 1994). However, they may undertake seasonal movements between aquatic and terrestrial habitats within their home range. As mentioned above, southwestern pond turtles will shift locations for thermoregulation and may occupy different portions microclimates within a site. They also will shift to areas with higher prey concentrations (Holland 1994). Females migrate short distances for nesting purposes – nesting behavior involves females depositing their eggs in upland areas, and generally up to 500 meters (1,600 feet) from their primary aquatic habitat (Rathbun et al. 1993, Reese and Welsh 1997). These nesting migrations are likely influenced by factors such as soil moisture, drainage, and sun exposure, which are crucial for successful egg incubation (Rathbun et. al. 1992). At the nesting site, females utilize their forelimbs to excavate a cavity in the soil, depositing their clutch within before burying it (Rathbun et al. 1993).

Sexual dimorphism is evident in SWPT, with males exhibiting distinct morphological characteristics compared to females. Males generally possess larger heads, more angular snouts, smaller and less rounded carapaces (upper shell), concave plastrons (lower shell), thicker tails, and yellowish chins lacking the dark markings or rosette patterns observed in females (Ernst et al. 2009).

Brumation/overwintering, a period of reduced activity during colder months, typically occurs in upland areas. This behavior allows the turtles to conserve energy and survive harsh winter conditions (Holland, 1994). Overwintering sites can include burrows in banks or streambeds (Holland 1994), rodent burrows (Stebbins 2004), or under litter and duff under vegetation (Rathbun et al., 1993.) Aquatic brumation may occur in milder climates, where turtles may burrow within mud or soils of the aquatic habitat (Holland 1994).

3.3.3.4 Occurrence within and Adjacent to the HCP Area

At Oceano Dunes SVRA, SWPT are often seen basking along the shoreline of Oso Flaco Lake and Oceano Lagoon. In June 2001, during a visual survey for CRLF, five SWPTs were observed in Oso Flaco Lake. In

addition, during a survey conducted by the USGS in 1998, three SWPT were observed at Oso Flaco Lake (USGS 1998). Several SWPT were also observed in Oso Flaco Lake and Arroyo Grande Creek within Oceano Dunes SVRA in 2006, as well as in Jack Lake (Map 14). A SWPT was rescued from fishing line at Oceano Lagoon and sent to an approved rehabilitation clinic in September 2016. In March of 2018, a rider posted on social media that he found a SWPT in the open riding area and moved it out of harm's way. The location of this observation is unknown. Jeff Alvarez from the Wildlife Project (Little, S. pers. comm. 2024) reviewed the social media photo and confirmed the species identification. In June 2018, Resource staff found turtle tracks in the open riding area near post 3.5, and the tracks were heading into Dunes Preserve. Pictures were taken and shown to Dr. Sam Sweet, Herpetology professor at U.C. Santa Barbara, who suspected subadult SWPT (Little, S. pers. comm. 2024). There are three occurrences of SWPT near Oceano Campground at Oceano Lagoon and one occurrence near North Beach Campground near Pismo Creek, all recorded within the last few years (iNaturalist 2024). CDPR staff consistently saw SWPT at Oso Flaco Lake and Oceano Lagoon during exploratory surveys completed in 2024 and 2025. Lastly, on an unknown date Holland observed SWPT at Pismo Creek (CNDDB 2024). Non-native species, including red-eared slider, largemouth bass, and bullfrog have been documented within the HCP area and have the potential to compete with or prey upon the native SWPTs within the SVRA.

3.3.3.5 Regulatory Status

CDFW designated SWPT as a species of special concern in 1994 (Jennings and Hayes 1994). In October 2023 the USFWS proposed to list SWPT as a threatened species (USFWS 2023c)**.** The public comment period closed on May 6, 2024, and the final rule is pending. As SWPT has only recently been proposed for federal listing, no critical habitat or recovery plan is available for this species.

3.3.3.6 Suitable Habitat in the HCP Area

Based on the recorded habitat preferences of SWPT, areas are shown in Map 14 that could serve as suitable aquatic and upland habitats for the species. Suitable habitat was identified based on the habitat associations described in sections 3.3.3.2 and 3.3.3.3, which includes aquatic features and the estimated dispersal distance of 500-meters to capture the estimated range of dispersal for nesting. Since intensive surveys for SWPT have not yet been implemented, the suitable habitat includes all potential aquatic habitats within the HCP area; however, this distribution is expected to be refined with further surveys and studies. In particular, some areas surrounding suitable aquatic habitat may not be suitable for SWPT due to the large amount of adjacent development that provides limited upland vegetative cover for SWPT and generally lacks optimal area for basking and nesting.

Potentially suitable upland habitat primarily includes a 500-meter buffer of upland area adjacent to areas of aquatic habitat mapped by the National Wetlands Inventory. Since this species is reliant on aquatic features for most of its life phases, it is not expected that SWPT would persist in areas of dune habitat or drier habitats within the SVRA. The use of the 500-meter estimate for nesting dispersal is meant to be a conservative estimate encompassing the nesting dispersal distances reported in various literature sources, which vary but were reported to be 500 meters or less (e.g., Jennings and Hayes 1994 estimated 400 m, Reese and Welsh 1997 estimated 500 m, and Department of Defense 2020 estimated 100 m). As SWPT are only known to occur in freshwater, the coastline was determined to be the limits within waters as delineated in the National Hydrography Dataset (USGS 2013).

A total of 5,005 acres were mapped as suitable SWPT habitat in the HCP area: 254 acres of aquatic habitat and 4,751 acres of upland habitat. Although some of this habitat is developed, for purposes of incidental take coverage, this HCP assumes SWPT could potentially occur throughout the 5,005-acre HCP area.

3.3.4 California Red-Legged Frog (*Rana draytonii*)

3.3.4.1 Regional Distribution and Abundance

The CRLF is the largest native frog in California (3.3 to 5.4 inches) and has been found at elevations from sea level to about 5,000 feet, with most observations occurring below 3,500 feet (USFWS 2002). The species is declining throughout its range (USFWS 2002). Historically, CRLF were common in coastal habitats from Point Reyes National Seashore, Marin County, California and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Hayes and Jennings 1988). The current restricted distribution of CRLF represents only a small percentage of its former distribution in the region. Historic records indicate that CRLF were present in most of the streams and ponds in the region.

CRLF has been extirpated or nearly extirpated from over 70 percent of its former range (Hayes and Jennings 1988, USFWS 1996). Historically, CRLF were found in 46 counties in California, but the species is now extirpated from 24 of these (USFWS 2002). Remaining populations occur in isolated localities in the Sierra Nevada, northern coast, and northern Transverse Ranges, and they are believed to be nearly extirpated from the southern Transverse and Peninsular ranges (USFWS 2002). This species is still common in the San Francisco Bay area and along the central coast (CNDDB 2024). Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of occupied habitat (USFWS 2002). The most secure aggregations of CRLF are found in aquatic sites that support substantial riparian and aquatic vegetation and lack invasive predators such as American bullfrogs.

The principal causes of decline and continued threats to CRLF include loss and degradation of habitat due to agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, invasive plants, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators. The reasons for decline and the degree of threats vary by geographic location. An important factor influencing the suitability of aquatic breeding sites is the general lack of introduced aquatic predators such as bullfrogs, mosquitofish (*Gambusia affinis*), bass (*Micropterus* spp.), sunfish (*Lepomis* spp.), and crayfish (USFWS 2002). While CRLF are occasionally known to persist in the presence of either bullfrogs or mosquitofish (and other invasive species), the combined effects of invasive frogs and fish often lead to extirpation of CRLF (USFWS 2002). Native predators such as raccoons, great blue herons (*Ardea herodias*), and garter snakes also eat CRLF.

Within the HCP area, principal threats include loss and modification of habitat, water diversions, including groundwater pumping, predatory and competitive introduced species, and degraded water quality.

3.3.4.2 Habitat Associations

Researchers studying wildlife in the Guadalupe-Nipomo Dunes region have found CRLF in wetland, riparian, and dune swale habitats (Map 15; Blecha et al 2007). Habitats of CRLF are characterized by dense, shrubby riparian vegetation associated with deep (2 feet), still or slow-moving water (Jennings and Hayes 1994). The shrubby vegetation preferred by CRLF is arroyo willow, cattails, and bulrushes (*Scirpus* sp.), found in wetland and riparian habitats. Riparian habitat includes vegetation that grows along banks and in the floodplains of streams and adjacent to ponds and that is dependent on the bordering water source for survival. Most important to CRLF is a breeding pond or slow-flowing stream reach or deep pool within a stream with vegetation or other material to which egg masses may be attached. These areas must hold water long enough for tadpoles to complete their metamorphosis into juvenile frogs that can survive outside of water (Jennings and Hayes 1994). CRLF eggs are usually attached to emergent vegetation in lagoons, streams, and a variety of natural and human-made ponds.

Water with a salinity of less than 4.5 parts per thousand is necessary to ensure the survival of embryonic stages. Juvenile CRLF seem to favor open, shallow aquatic habitats with dense, submergent vegetation.

CRLF are nocturnal, although sub-adults are sometimes active during the day (Jennings and Hayes 1994). CRLF have a varied diet that includes both invertebrates and vertebrates (USFWS 2002). The moisture and camouflage provided by riparian vegetation provides foraging and resting habitat. During dry periods, CRLF are seldom found far from water. However, during wet weather, individuals may make overland excursions through upland habitats over distances of up to 2 miles in order to find new breeding locations or food. These dispersal movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors. Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions. CRLF disperse through uplands such as grasslands and typically find cover amongst boulders or rocks and organic debris such as downed trees or logs, industrial debris, and agricultural features such as drains, watering troughs, spring boxes, and abandoned sheds (USFWS 2001a). CRLF also use small mammal burrows and moist leaf litter for cover (Jennings and Hayes 1994, USFWS 1994). Incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (USFWS 1996). Use of this habitat type by CRLF is most likely dependent on year-to-year variations in climate and habitat suitability and varying requisites per life stage (USFWS 2001a).

3.3.4.3 Breeding and Migration

CRLF breed from November through April, with the earlier breeding records occurring in southern localities. Females deposit egg masses on emergent vegetation so that the masses float on the surface of the water. Eggs hatch in 6 to 14 days, while tadpoles take 3.5 months or longer to metamorphose (Jennings, Hayes and Holland 1992). Males attain sexual maturity by 2 years and females by 3 years of age (Jennings and Hayes 1994). CRLF may live 8 to 10 years. CRLF occupies aquatic and terrestrial habitats during different stages of its life and during different seasons of the year. While tadpoles stay in the breeding area until metamorphosis in late summer/fall, sub-adult and adult CRLF may disperse locally shortly after metamorphosis, July to September, and away from their natal habitats during warm rain events; however, CRLF tadpoles have been observed to overwinter in their natal habitat in some areas (Fellers, Launer, et al. 2001). Most adult CRLF remain near or within aquatic breeding habitat. Adults that disperse typically disperse during the wet season after rain events (November through April), with most of the overland movements occurring at night; however, CRLF may move from breeding sites at any time of the year depending on habitat availability and the environmental conditions of the aquatic habitat (USFWS 2010d). CRLF have been documented to travel as far as 2.2 miles from non-breeding to breeding habitats (Bulger, Scott and Seymour 2003). These long-distance movements are migrations rather than simply moving between habitats (USFWS 2010d).

Most individuals make short-range forays into upland habitats for periods of days to weeks in response to precipitation but return to their aquatic habitat at the end of the upland interval. These are called non-migrating frogs. These individuals show a clear response to rainfall during the summer and early winter months (Bulger, Scott and Seymour 2003). In (Bulger, Scott and Seymour 2003), frogs were virtually always less than 16 feet from their pond or stream of residence during dry intervals of the summer, but moved outward into upland habitats to distances of up to 427 feet in response to summer rains. Median distance from water increased to a constant 49 to 82 feet with the onset of winter rains. Ninety percent of non-migrating frogs during the summer and early winter months were always within 197 feet of water. Frogs made little use of rainfall and upland habitat during mid- to late-winter, and this appeared to be due to breeding chronology. From February through May, 90 percent of non-migrating frogs were always within 20 feet of water. Non-migrating frogs spent the most time on land during the early winter, then summer, and very little time was spent on land in mid- to late-winter. CRLF have brief

bouts of movement followed by longer intervals of inactivity during their migration (Bulger, Scott and Seymour 2003).

Some individual CRLF make overland movements between two aquatic sites, typically before or after breeding. These are called migrating frogs. Migrating frogs most frequently migrated between breeding ponds from October 31 to November 25, usually in association with rainfall or along a waterway with running water along its length. Post-breeding migration typically occurs between January and May in association with a 1-day rainfall. Migrating frogs moved between sites that were separated by map distances of 656 to 9,186 feet. Migrations tended to be an approximately straight line between the source and target site. Frogs moved through coniferous forest, grass/scrub rangeland, and agricultural land (Bulger, Scott and Seymour 2003).

Where obvious, direct corridors exist between two occupied aquatic sites, it undoubtedly will receive regular use by migrating frogs. However, there is no evidence from this study that natural corridors are either essential to migrating frogs or that they will be used preferentially over alternative upland routes (Bulger, Scott and Seymour 2003).

Frogs make small-scale movements (less than 98 feet) without leaving the breeding sites (i.e., local dispersal) throughout the year. Movements of greater than 98 feet generally coincide with winter rains, although some frogs did not move until their seasonal habitat was on the verge of drying. In general, frogs departed from breeding ponds with the onset of heavy winter rains. Frogs departed from breeding ponds at varying times throughout the rainy season, with some frogs remaining in permanent ponds all year (Fellers and Kleeman 2007).

3.3.4.4 Occurrence within and Adjacent to the HCP Area

CDPR has conducted modified protocol-level surveys for CRLF during the spring and summer since 2017. Results from these surveys are presented in Table 3-13 and show the highest number observed during a single survey (see also Map 15). Given that the first recorded observation of a CRLF at the Pismo State Beach Golf Course occurred during 2024 breeding season surveys, survey results are provided through June 2024.

Table 3-13. CRLF Protocol-Level Survey Results (Highest Number Observed) and Other CRLF Observations in the HCP Area (January 2017– June 2024)

Location	No. Adults Observed Low - High	No. Juveniles Observed Low - High	No. Tadpoles Observed Low - High	No. Egg Masses Observed Low – High[1]
Arroyo Grande Creek and Estuary	2017: 0 2019: 12 2020: 12 2021: 7 2022: 1 2023: 3 2024: 0	2017: 3 2019: 12 2020: 16 2021: 8 2022: 0 2023: 4 2024: 0	2017: 1 2019: 2 2020: 0 2021: 0 2022: 0 2023: 0 2024: 0	2017: 0 2019: 1 2020: 0 2021: 0 2022: 0 2023: 0 2024: 0
Carpenter Creek	2017: 0 2018: 0 2020: 0 2023: 0 2024: 0	2017: 0 2018: 0 2020: 0 2023: 0 2024: 0	2017: 0 2018: 0 2019: 1[2] 2020: 0 2023: 0 2024: 0	2017: 0 2020: 0

Table 3-13. CRLF Protocol-Level Survey Results (Highest Number Observed) and Other CRLF Observations in the HCP Area (January 2017– June 2024)

Location	No. Adults Observed Low - High	No. Juveniles Observed Low - High	No. Tadpoles Observed Low - High	No. Egg Masses Observed Low – High[1]
Little Hawaii	2017: 0 2018: 0 2019: 0 2020: 0 2023: 0 2024: 0	2017: 0 2018: 0 2019: 0 2020: 0 2023: 0 2024: 0	2017: 0 2018: 0 2019: 0 2020: 0 2023: 0 2024: 0	2017: 0 2019: 0 2020: 0
Little Oso Flaco Lake	2017: 1[3] 2018: 1 2019: 2 2020: 3 2021: 2 2022: 2 2023: 3 - 6 2024: 0 - 1	2017: 0 2018: 0 2019: 5 2020: 4 2021: 0 2022: 0 2023: 0 2024: 0	2017: 0 2018: 0 2019: 0 2020: 0 2021: 0 2022: 0 2023: 0 2024: 0	2017: 0 2019: 0
Meadow Creek[4]	2017: 0 2018: 0 2020: 0 2023: 0 2024: 0	2017: 0 2018: 0 2020: 0 2023: 0 2024: 0	2017: 0 2018: 0 2020: 0 2023: 0 2024: 0	2017: 0 2020: 0
Oso Flaco Creek	2017: 0 2018: 0	2017: 0 2018: 0	2017: 0 2018: 0	2017: 0
Oso Flaco Lake	2017: 0 2018: 0 2019: 1 2020: 0 2021: 2 2022: 1 2023: 7 2024: 4	2017: 0 2018: 0 2019: 2 2020: 1 2021: 0 2022: 0 2023: 0 2024: 0	2017: 0 2018: 0 2019: 0 2020: 0 2021: 0 2022: 0 2023: 0 2024: 0	2017: 0 2019: 0
Oceano Lagoon	2017: 0 2018: 0 2019: 1[5] 2020: 0 2022: 0	2017: 0 2018: 0 2019: 0 2020: 0 2022: 0	2017: 0 2018: 0 2019: 0 2020: 0 2022: 0	2017: 0 2019: 0
Pismo State Beach Golf Course	2017: 0 2018: 0 2024: 1	2017: 0 2018: 0 2024: 0	2017: 0 2018: 0 2024: 0	2017: 0
Pismo Creek Lagoon	2017: 0 2018: 0	2017: 0 2018: 0	2017: 0 2018: 0	2017: 0

Table 3-13. CRLF Protocol-Level Survey Results (Highest Number Observed) and Other CRLF Observations in the HCP Area (January 2017– June 2024)

Location	No. Adults Observed Low - High	No. Juveniles Observed Low - High	No. Tadpoles Observed Low - High	No. Egg Masses Observed Low – High[1]
Pismo Lake	2017: 0 2018: 0	2017: 0 2018: 0	2017: 0 2018: 0	2017: 0

Notes:

Table reflects surveys through June 2024. If year is listed, at least one survey was conducted at the location that year.

[1]Only includes years with a daytime survey.

[2]Observed incidental to fisheries surveys.

[3]Two additional CRLF were heard; however, they were never observed, and a positive identification of either individual was not obtained.

[4]Two CRLF were observed in Meadow Creek in 2012 near the confluence with Arroyo Grande Creek (Terra Verde Environmental Consulting 2012)

[5]Positive identification was not obtained. One CRLF was previously observed near Lakeside Avenue in 2012 by San Luis Obispo County workers removing bulrush (K. Drexhage, pers. comm. 2016).

Sources: (Cleveland 2023, Little, S. pers. comm. 2024)

As shown in Table 3-13, CRLF individuals (adults and juveniles) have been observed in Arroyo Grande Creek and Estuary, Little Oso Flaco Lake, Oso Flaco Lake, and Pismo State Beach Golf Course (Cleveland 2023, 2024). In addition, a CRLF tadpole and egg mass were observed in Arroyo Grande Creek and Estuary in 2017 and 2019, and CRLF tadpoles were sighted in Arroyo Grande Estuary in 2019 and 2023. Additional recent observations, outside of CRLF protocol surveys, include a tadpole[39] in Carpenter Creek in 2019 presumed to have been a CRLF, numerous larvae at various stages of development within Arroyo Grande Lagoon (Rischbieter 2021), and dozens of CRLF tadpoles and 1 adult within the reach of Oso Flaco Lake (Rischbieter 2023). Suitable breeding habitat for CRLF encompasses 178 acres within the HCP area, while upland habitat encompasses 4,827 acres. Pismo Lake contains suitable habitat, but there are no modern records of presence, presumably because of warm-water-introduced fish and bullfrogs (Cleveland 2018b). The reaches of Meadow Creek from the Oceano Lagoon north to State Route 1 are confined to a set channel, in places by levees, for flood-control purposes. In addition, much of the runoff from developed portions of the City of Grover Beach is directed to this reach of the creek. Due to the flood control and drainage practices, the water quality in this area appears to be heavily degraded, and pools are choked with vegetation. The poor water quality and steep banks in this area provide little suitable habitat for aquatic species such as CRLF in the northern portion of Meadow Creek. Some aquatic species do persist; however, a large population of bullfrog occurs in the creek (Althouse and Meade, Inc. 2005, amended 2009). Farther downstream in Oceano Lagoon, one CRLF was observed near Lakeside Avenue in 2012 by San Luis Obispo County workers removing bulrush (K. Drexhage, pers. comm. 2016). Two CRLF were also observed in Meadow Creek in 2012 near the confluence with Arroyo Grande Creek (Terra Verde Environmental Consulting 2012).

[39] Based on its characteristics, a tadpole observed incidental to fisheries surveys is presumed to have been a CRLF (Little, S., pers. comm. 2019).

CRLF have been observed during fisheries surveys within Arroyo Grande Creek and during monitoring for a nearby flood control maintenance project (Cleveland 2009, Rischbieter 2009a, 2010, 2013, CNDDB 2024). In addition, CRLF were regularly found in Arroyo Grande Creek from 1996 through 2009 from 0.3 mile upstream from the mouth (the CDPR boundary) to the railroad (Cleveland 2009, CNDDB 2024). CRLF have also been observed within Arroyo Grande Creek within the HCP area based on observations for biological habitat assessments for other projects (Terra Verde Environmental Consulting 2012, Zitt 2017) The habitat within this area typically consists of pools with tall willows and emergent vegetation. CRLF population observations within Arroyo Grande Creek and Estuary are listed in Table 3-13. Years where CRLF were not observed are attributed to significant drought (Cleveland 2017, Cleveland 2018a).

CRLF habitat is distributed throughout the Oso Flaco Lake system. The freshwater lakes in the Oso Flaco Lake area occupy a surface area of 82 acres and are classified as palustrine emergent wetlands. CNDDB reports CRLF within Oso Flaco Creek upstream of the HCP area boundary (outside of CDPR ownership) on three separate survey dates beginning in 2002 (CNDDB 2024). The channel in this area has ponds lined with cattails and bulrush and a willow riparian area. CNDDB reports CRLF occurring at Little Oso Flaco Lake in 1998, and surveyors observed one adult in Little Oso Flaco Lake in 2017, two adults in 2018 (Cleveland 2018b), up to 3 adults and 5 juveniles in 2019, up to 3 adults and 1 juvenile in 2020, up to 3 adults and 5 juveniles in 2021, up to 3 adults in 2022, and up to 12 adults in 2023 (Cleveland 2023). Levine-Fricke Recon was contracted to conduct herpetological surveys, including protocol surveys for CRLF in 1998. During these surveys, there was only one CRLF found near the pump house at Little Oso Flaco Lake (Schneider 2000). Surveyors heard 1 adult calling and observed 2 juveniles in Oso Flaco Lake in 2019, up to 2 juveniles in 2020, 2 adults in 2021, 1 adult in 2022, and up to 8 adults in 2023 (Cleveland 2023). In June 1996 Margie Harker and Sue Christopher surveyed Oso Flaco Lake for CRLF, however, none were found (Schneider 2000). CRLF were also found in Snake Lake and Finger Lake, two slack wetlands very close to Oso Flaco Lake during an early spring survey in 2000 (Schneider 2000). Seven CRLF were heard or seen at Finger Lake, and one was seen in Snake Lake during a nighttime survey. One CRLF egg mass and many freshly hatched tadpoles were found in Finger Lake during a day survey (Schneider 2000). During surveys conducted in 1999, CRLF were found in Snake Lake, Finger Lake, and in habitat surrounding Oso Flaco Lake (Schneider 2000). Habitat in this area consists of dune swales dominated by rush (*Juncus* sp.), arroyo willow (*Salix lasiolepis*, and poison oak (*Toxicodendron diversilobum*) and may no longer provide suitable CRLF breeding habitat. Dune scrub comprises the adjacent uplands. CRLF have also been observed in Jack Lake, in the Phillips 66 leasehold approximately 0.7 miles northeast of Little Oso Flaco Lake in 2006.

Numerous water bodies, wetland habitats, and permanent and intermittent creeks that occur within and immediately adjacent to the HCP area could also support small populations of CRLF depending on rainfall, irrigation practices, and presence of non-native predators such as sunfish and bullfrog. These include Pismo Creek Lagoon, Meadow Creek, Carpenter Creek, Oceano Lagoon, and numerous unnamed water bodies such as the dune slack lakes. In general, while these wetlands generally provide low-quality habitat, with bullfrogs and mosquito fish present, the seasonal drying of these wetlands may help to benefit CRLF by periodically killing off their more water-dependent predators. CRLF is also known from CNDDB and other records to occur outside of the HCP area. For example, in 2000, CRLF were found in a marshy area south of Oso Flaco Lake (CDPR 2001b). CRLF are also known to occur at the Guadalupe-Nipomo Dunes National Wildlife Refuge, immediately south of the HCP area (USFWS 2013c).

Habitat conditions for CRLF within the HCP area vary in water quality and the presence of invasive predators. For example, largemouth bass (*Micropterus salmoides*), crayfish, and a snapping turtle (*Chelydra serpentina*) have been found in Oso Flaco Lake (CDPR 2001b, CDPR 2017b, USGS 1998). Poor water quality in Oso Flaco Lake, which receives agricultural discharge, may negatively affect resident CRLF.

3.3.4.5 Regulatory Status and Recovery Plan

The USFWS listed the CRLF as a threatened species in 1996 (USFWS 1996) and issued the final CRLF Recovery Plan in 2002 (USFWS 2002). San Luis Obispo County is within Recovery Unit 5. Critical habitat for CRLF has been designated and redesignated several times by the USFWS (USFWS 2001a, USGS 2006c). The current rule for final critical habitat was finalized in 2010 (USFWS 2010d). There is no designated critical habitat within the HCP area. CRLF is also a CDFW species of special concern.

The CRLF Recovery Plan identifies five criteria for recovery and seven general actions (USFWS 2002). The overall recovery strategy involves:

- Protecting existing populations by reducing threats
- Restoring and creating habitat that will be protected and managed in perpetuity
- Surveying and monitoring populations and conducting research on the biology and threats of subspecies
- Re-establishing subspecies populations within its historic range
- Determining, protecting, and managing additional habitat needed for population connectivity, recolonization, and dispersal

The Recovery Plan recommends management and protection plans for each watershed and Core Recovery Area to address the recovery strategies as applicable. Management and protection plans are to include proposals to incrementally protect (via conservation easements, fee title, acquisitions or other mechanisms) important breeding and dispersal habitats. Arroyo Grande Creek is identified as a Core Recovery Area and is within the HCP area. In addition, Oso Flaco Creek and Oso Flaco Lake are included in Core Recovery Area 24 and are within the HCP area. Specific conservation needs identified in the Recovery Plan for the Arroyo Grande Core Recovery Area 23 and Santa Maria-Santa Ynez Core Recovery Area 24 are:

- Arroyo Grande Creek: Restore habitat, protect habitat connectivity (Recovery Task 1.23).
- Santa Maria-Santa Ynez River: Protect existing populations; reduce contamination of habitat; control non-native predators; implement management guidelines for recreation; cease stocking dune ponds with non-native, warm water fish; manage flows to decrease impacts of water diversions; implement guidelines for channel maintenance activities (Recovery Task 1.24).

Task 1.23 of the Recovery Plan also recommends that CDPR and USFWS develop and implement a management and protection plan for Core Recovery Area 23 (USFWS 2002). Management target numbers are not part of the CRLF Recovery Plan.

3.3.4.6 Suitable Habitat in the HCP Area

CRLF habitat was mapped in the HCP area to identify potentially suitable aquatic habitat and upland habitat (Map 15). Aquatic habitat was identified based on the habitat associations described in section 3.3.4.2 and the aquatic areas known and suspected to be occupied by CRLF. CRLF is known to occur in Arroyo Grande Creek and Estuary, Meadow Creek, Carpenter Creek, Oceano Lagoon, Oso Flaco Creek, Little Oso Flaco Lake, Jack Lake, and Oso Flaco Lake (Cleveland 2009, Terra Verde Environmental Consulting 2012, K. Drexhage, pers. comm. 2016, Cleveland 2023, CNDDB 2024, Little, S. pers. comm. 2024). Mapped aquatic habitat includes these areas as well as all adjacent riparian areas, which could serve as dispersal habitat. Pismo Lake would provide potentially suitable aquatic habitat; however, it is not known to be occupied due to an abundance of bullfrogs. Because it lacks adequate vegetative cover, Pismo Creek Lagoon does not provide aquatic or riparian habitat for CRLF within the HCP area. A

presumed CRLF tadpole was observed in Carpenter Creek in 2019, but no CRLF of any life stage were observed during subsequent surveys. The creek was inundated with non-native fish (Little, S., pers. comm. 2019). Carpenter Creek may be suitable CRLF habitat in some years if water conditions are suitable and non-native predators are limited.

Potentially suitable upland habitat primarily includes areas that may be used for dispersal and, to a lesser extent, aestivation, and foraging. Potentially suitable upland habitat was considered all habitat within a 1-mile buffer around aquatic habitat. In the USFWS review of dispersal distances in the final rule for critical habitat (USFWS 2010d), the USFWS concluded that 1 mile is reflective of the average dispersal distance for CRLF. Upland habitat was limited at the coastline to the mean high water as calculated by National Ocean and Atmospheric Administration and delineated in the National Hydrography Dataset (USGS 2013), as CRLF are sensitive to high salinity (USFWS 2002). Developed areas, such as the corporation yard, are not included in upland habitat given the hardscape and dense development in these areas. Upland habitat outside the HCP area is also not included in Map 15, given the level of urban development.

A total of 5,005 acres were mapped as suitable CRLF habitat in the HCP area: 178 acres of aquatic habitat and 4,827 acres of upland habitat. Although some of this habitat is developed, for purposes of incidental take coverage, this HCP assumes SWPT could potentially occur throughout the 5,005-acre HCP area.

3.3.5 Western Spadefoot (*Spea hammondii*)

3.3.5.1 Regional Distribution and Abundance

The western spadefoot (WSF) is a fossorial amphibian with a distribution nearly restricted to California. Adults are typically 38.0-63.0. mm (1.5-2.5 inches) in snout-to-urethral vent length and can be found at elevations from sea level to 1,385 meters (4,500 feet; USFWS 2023). Adults are light green to grey with four lighter stripes that form an hour-glass shaped area and have a white underbelly (Jennings and Hayes 1994). WSF have eyes with vertical and pale pupils (Department of Defense 2022). Along with the vertical pupils not seen in other groups of toads, the most characteristic feature of the western spadefoot is the spade shaped keratinized inner metatarsal tubercle (spur) located on the back of each hind limb (Department of Defense 2022). Recent studies have shown that there is detectable genetic divergence between the north and southern distributions of the species (Rose, Halstead and Fisher 2020, Rose, Halstead and Packard, et al. 2022), with the Transverse Ranges largely forming the separation between the two groups. Based on the maps provided by Rose (2020), WSF in the HCP area likely belong to the northern genetic group of spadefoots.

Approximately 80% of WSF's geographic range has been impacted by human activities in Southern California (Baumberger et al. 2019, Center for Conservation Biology 2023). This species' distribution extends from the Baja peninsula north of San Fernando Canyon along the coast and coastal valleys to Redding in Shasta County, California (Amphibiaweb 2024). However, the historic distribution is believed to have occurred throughout most of southern California, extending through coastal and Central Valleys into northern California. Major threats to WSF populations primarily include habitat loss and fragmentation (Baumberger et al. 2019; Rose et al. 2020, 2022). Predators to WSF primarily include invasive aquatic animals such as introduced bullfrogs and fish that may feed on adults or larvae (Jennings and Hayes 1994).

3.3.5.2 Habitat Associations

WSF has specific needs for both its terrestrial and aquatic life stages, requiring both aquatic and terrestrial habitats to be close in proximity due to their limited dispersal range (Jennings and Hayes

1994, Stebbins and McGinnis 2012). The WSF is almost completely terrestrial and enters water only to breed (USFWS 2023b). WSF may be found in a wide variety of habitats ranging from grassland, coastal scrub, chaparral, and oak woodland; however, they are generally associated with areas near water, particularly seasonal depressions or convex landforms that support water ponding, grassy understory, and with soils that are friable (crumbly) enough to dig burrows. In terrestrial habitats they generally favor open areas with grassy vegetation and may favor soils with more silt than clay components (Baumberger, et al. 2019, Rose, Halstead and Fisher 2020, Rose, Halstead and Packard, et al. 2022). This grassy habitat provides the right soil composition for them to construct burrows for refuge, especially during the long dry season (Stebbins and McGinnis 2012). Morey and Guinn ((1992) as cited in USFWS (2023b)) report that various insects, including crickets, butterflies, beetles, flies, ants, and earthworms, are known to be food sources of WSF.

Genetic studies have shown that there may be some variation between the northern and southern populations in habitat selection, with the southern group potentially using areas with shrubs or scrub more frequently in addition to grasslands (Rose, Halstead and Fisher 2020, Rose, Halstead and Packard, et al. 2022); however, additional studies are necessary to test this assumption.

For breeding, WSF are reliant on aquatic habitats. They obligately breed in seasonally ponded areas, needing temporary aquatic habitats like vernal pools, seasonal streams, or sand/gravel washes for reproduction and larval development (Stebbins and McGinnis 2012). Temporary wetlands may be preferable because they have fewer predators than permanent water bodies (Thomson, Wright and Shaffer 2016). While they prefer temporary pools, they have been observed using a variety of natural and even human-made wetlands, including permanent ponds, rivers, and even temporary puddles (CNDDB 2024).

3.3.5.3 Breeding and Migration

Breeding of WSF is typically correlated with heavy rainfall occurrences, and larvae typically occupy ephemeral pools of water that remain ponded for an average of 81 days (Morey and Reznick 2004). There is pronounced sexual dimorphism in some individuals, with males often having a dark throat patch, and mating is inguinal. Females lay approximately 10-20 eggs on decaying vegetation or litter in seasonally ponded areas that hatch in 0.6-6 days (Jennings and Hayes 1994). Larval development typically takes 4-11 weeks (USFWS 2023b). It is posited that they may take up to 2 years to reach maturity for breeding (Jennings and Hayes 1994); however, more studies are necessary for confirmation. Once larvae reach maturity and feed, they will enter a state of dormancy. They may dig their own burrows using the spade on their hindlimbs; however, they are known to borrow burrows from small mammals (USFWS 2023b).

More studies are necessary to determine the distances that WSF travel once metamorphosized. As burrows are typically found close to breeding sites, it is anticipated that the distance travelled is small. The home range of an adult WSF is currently unknown. Preliminary studies by Baumberger et al. ((2019) as cited in USFWS (2023b)) within two sites in Orange County during relatively dry years showed that most WSF dispersed less than 110 meters (361 feet) from pools, with the largest dispersal detection of 262 meters (860 feet), and they may move in time periods not directly correlated with reported rainfall. Additional research has resulted in the detection of a 460-meter (1,509 feet) dispersal during a wetter year (USFWS 2023b), which may indicate that dispersal can be much greater during greater rainfall periods. The size of the home range of WSF appears to depend on the location and needs more study, with most being less than 1 hectare (2.5 acres); however, one individual was found to have a home range exceeding 6 hectares (15 acres), and travel was estimated to be up to 486 meters (1,600 feet) from the breeding site in a study by Halstead et al. (2021).

3.3.5.4 Occurrence within and Adjacent to the HCP Area

The WSF is often difficult to detect due to extended periods of its life cycle spent underground. Very little is known about WSF in the HCP area, and the few HCP area sightings that exist have been incidental. The last possible sighting was by District staff on October 4, 2011, at the Eucalyptus Tree vegetation island, while doing pitfall trapping (CDPR 2024c). Pictures were sent to Dr. Sam Sweet, Herpetology professor at U.C. Santa Barbara, who suspected WSF (2024). Three WSF were also heard at Oso Flaco Lake in February and March of 2000 (Schneider 2000). In addition, suitable habitat for WSF is present in wet years. At least forty incidental sightings of WSF have been seen in upland habitat between 2000-2024 at the Guadalupe Restoration Project, the former oil field that is owned and managed by Chevron Corporation (Little, S. pers. comm. 2024).

3.3.5.5 Regulatory Status and Recovery Plan

CDFW designated WSF as a species of special concern in 1994 (Jennings and Hayes 1994). On December 5, 2023, the USFWS proposed to list WSF as a threatened species (USFWS 2023d). The public comment period closed on February 5, 2024, and the final rule is pending. As WSF has only recently been proposed for federal listing, no critical habitat or recovery plan is available for this species.

3.3.5.6 Suitable Habitat in the HCP Area

Using the documented habitat preferences of the WSF as a basis, Map 16 illustrates areas that have the potential to function as appropriate aquatic habitats for the species. Aquatic habitat was identified based on the habitat associations described in sections 3.3.5.2 and 3.3.5.3, which includes aquatic features. Since intensive surveys for WSF have not yet been implemented, the suitable breeding habitat and upland habitat (during terrestrial and estivation times) includes all potential upland and aquatic habitats within the HCP area; however, this distribution is expected to be refined with further surveys and studies. In particular, some areas surrounding waters may not be suitable for WSF due to the large amount of adjacent development and soil compaction that prevent the creation of burrowing sites for aestivation.

Potential WSF breeding habitat primarily includes areas of aquatic habitat mapped by the National Wetlands Inventory, which comprise potentially suitable habitat for breeding. Note that preliminary research appears to indicate that the dispersal distance into upland habitat may be less than 500 meters (0.31 miles; see discussion in section 3.3.5.3). Since this species is reliant on aquatic features for breeding, it is anticipated that drier habitats within the HCP area too distant from breeding sites may not support aestivation. Given the ephemeral nature of WSF breeding habitat, it is possible the National Wetlands Inventory does not include all sites that could provide potential breeding habitat. As WSF are only known to use fresh water for breeding, the coastline was determined to be the limits within waters as delineated in the National Hydrography Dataset (USGS 2013). A total of 5,005 acres were mapped as suitable WSF habitat in the HCP area: 135 acres of aquatic habitat and 4,870 acres of upland habitat. Although some of this habitat is developed, for purposes of incidental take coverage, this HCP assumes WSF could potentially occur throughout the 5,005-acre HCP area.

3.3.6 Tidewater goby (*Eucyclogobius newberryi*)

3.3.6.1 Biology and Distribution

Endemic to coastal, brackish-water habitats of California, tidewater goby is a small, elongate fish rarely exceeding 2 inches, with two dorsal fins, large pectoral fins, and eyes oriented high on the head. Male tidewater gobies are nearly transparent, with a mottled brownish upper surface, and they tend to remain near their burrows. Female tidewater gobies develop darker colors, often black, on the body and

dorsal and anal fins, with pectoral and pelvic fins, head, and tail remaining grey or brown (USFWS 2005a).

Tidewater gobies generally only live for about 1 year, with few individuals living longer (Swift, Nelson, et al. 1989, Moyle, et al. 1995). Reproduction occurs year-round, although distinct peaks in spawning occur, often in early spring and late summer (USFWS 2005a). Fluctuations in reproduction are likely due to the death of breeding adults in early summer and colder temperatures or hydrological disruptions in winter (Swift, Nelson, et al. 1989). Male tidewater gobies begin digging breeding burrows in relatively unconsolidated, clean, coarse sand, in April or May after lagoons are closed off from the ocean (Swift, Nelson, et al. 1989). Female tidewater gobies aggressively spar with each other for access to males with burrows for laying their eggs. Female tidewater gobies can lay 300 to 500 eggs per clutch, depending on the size of the individual female (Swift, Nelson, et al. 1989). Male tidewater gobies remain in the burrow to guard the eggs, which are attached to sand grains in the burrow ceiling and walls. The male tidewater goby cares for the embryos for approximately 9 to 11 days until they hatch, rarely if ever emerging from the burrow to feed.

Historically ranging from Tillas Slough (mouth of the Smith River, Del Norte County) near the Oregon border to Agua Hedionda Lagoon (northern San Diego County), tidewater gobies are still found today confined within that original known range.[40] Tidewater gobies are absent from areas where the coastline is steep and streams do not form lagoons or estuaries. The tidewater goby lacks an explicit marine dispersal phase and spends its entire life within discrete coastal wetlands, naturally separated by the presence of sandbars that restrict access to the Pacific Ocean (McCraney, et al. 2010). These sandbars generally breach 1–2 times per year during periods of high surf and freshwater input, resulting in rapid draining of the estuary (Krauss, Militello and Todoroff 2002). Thus, successful migration between lagoon habitats requires coordination of breaching events, typically between geographically proximate habitats, and dispersal is passive (Lafferty, Swift and Ambrose, Extirpation and Recolonization in a Metapopulation of an Endangered Fish, the Tidewater Goby. 1999, Dawson, Stanton and Jacobs 2001, McCraney, et al. 2010). Migration between lagoons is thought to be rare (McCraney, et al. 2010).

Tidewater goby populations (i.e., localities) are believed to occur as metapopulations[41] (Lafferty, Swift and Ambrose, Extirpation and Recolonization in a Metapopulation of an Endangered Fish, the Tidewater Goby. 1999, USFWS 2005a). Tidewater goby populations are frequently isolated from other local populations by extensive areas of unsuitable habitat, and tidewater gobies occupy coastal lagoons and estuaries that in most cases are separated from each other by the open ocean. Very few tidewater gobies have ever been captured in the marine environment (Swift, Nelson, et al. 1989), which suggests this species rarely occurs in the open ocean. (Lafferty, Swift and Ambrose, Extirpation and Recolonization in a Metapopulation of an Endangered Fish, the Tidewater Goby. 1999) suggest that some tidewater goby populations persist on a consistent basis (potential sources of individuals for recolonization), while other tidewater goby populations appear to experience intermittent extirpations. Flood flow and desiccation extirpate tidewater goby habitats, imparting an extirpation/recolonization metapopulation dynamic (Lafferty, Swift and Ambrose, Extirpation and Recolonization in a Metapopulation of an Endangered Fish, the Tidewater Goby. 1999), and extirpation appears to be

[40] Since their original description in 1856 (Girard), tidewater goby have been subsequently divided into two species, with *E. kristinae* now occupying the populations in the southernmost (San Diego County) extent of the range (Swift, et al. 2016).

[41] A *metapopulation* is a group of partially isolated populations belonging to the same species that are connected by pathways of immigration and emigration. Exchange of individuals occurs between such populations, enabling recolonization of sites from which the species has recently become extirpated (locally extinct).

accentuated by anthropogenic habitat modification and introduction of invasive species (Swift, Nelson, et al. 1989). Some localities where tidewater gobies have been extirpated have apparently been recolonized when extant populations were present within a relatively short distance of the extirpated population (USFWS 2007b).

Tidewater goby is known to have historically inhabited at least 135 localities (USFWS 2005a). Presently 23 of the 134 (17 percent) documented localities are considered extirpated and 55 to 70 (41 to 52 percent) of the localities are naturally so small or have been degraded so much over time that long-term persistence is uncertain. Principal threats to the tidewater goby include loss and modification of habitat, water diversions (including groundwater pumping), predatory and competitive introduced fish species, habitat channelization, and degraded water quality (USFWS 2005a).

Data on tidewater goby population dynamics are limited. Estimates of population size are generally lacking due to the constant variability in local abundance. Seasonal changes in distribution and abundance further hamper efforts to estimate population size for this short-lived species. Tidewater goby populations can also vary with between-year changes in environmental conditions such as drought (USFWS 2007b).

3.3.6.2 Habitat Associations

Tidewater gobies are adapted to coastal lagoons, marshes, the uppermost brackish zone of larger estuaries, and lower-stream reaches where the water is fairly still but not stagnant. Tidewater gobies rarely inhabit marine or freshwater habitats. They avoid open areas where there is strong wave action or strong currents, though they enter marine environments when flushed out of brackish habitats by high flows (or normal breaching of lagoon sandbars, if present) following storm events. Tidewater gobies prefer a sandy substrate for breeding, but they can be found on rock, mud, and silt substrates as well.

Tidewater goby is almost unique among fishes of the Pacific Coast of the U.S. in its restriction to low-salinity water. The species is typically found in water less than 3.3 feet deep and salinities of less than 12 parts per thousand (ppt), though they have been documented in waters with salinity levels from 0 to 42 ppt, water depths from 10 to 79 inches, and waters with temperature levels from 46 to 77 degrees Fahrenheit (°F; 8 to 25 degrees Celsius [°C]) (USFWS 2005a). The tidewater goby is benthic in nature, with a diet consisting mostly of small crustaceans and aquatic insects (Swift, Nelson, et al. 1989).

3.3.6.3 Occurrence within and Adjacent to the HCP Area

Within the HCP area, tidewater goby is known to occur in Pismo Creek Lagoon and Arroyo Grande Creek and Estuary (Map 17). Both creeks arise from the mountains of San Luis Obispo County and flow westward to the Pacific Ocean. The mouths of both creeks end at coastal lagoons/estuaries typical of small coastal watersheds that usually form terminal sandbars in low-flow summer and fall periods. A lagoon is typically present year-round at Pismo and Arroyo Grande creeks; however, during some periods of drought, Arroyo Grande Lagoon has been known to dry up nearly completely. The lagoon's size and configuration vary due to runoff and waves. In most winters, sufficient runoff is present after large rain events to breach the sandbar formed at the crest of the beach and create a continuous flow into the ocean.[42] The creeks then again form closed lagoons in the summer and fall when runoff and streamflow are very low or absent. Tidewater gobies have also been observed in Carpenter Creek, which

[42] Water naturally backs up behind the Arroyo Grande Creek sandbar, and CDPR does not facilitate or propose mechanical or other artificial breaching of the sandbar, which can pose a risk to listed species. Any agency proposing to breach the sandbar for flood abatement or other purposes would be responsible for obtaining necessary permits, including take authorization.

can connect to the Pismo Creek Lagoon, and in lower Meadow Creek, which drains into Arroyo Grande Creek and Estuary from Oceano Lagoon (Rischbieter 2014). Tidewater gobies have also occasionally been documented in lower Oso Flaco Creek (Rischbieter 2024a); these observations are significant in part because the Oso Flaco watershed includes designated critical habitat for tidewater goby (USFWS 2013d). Tidewater goby habitat encompasses 45 acres within the HCP area. Tidewater goby is also known to occur in San Luis Obispo Creek and near the mouth of the Santa Maria River near the HCP area (each about 9 miles to the north and south, respectively; (USFWS 2005a, USFWS 2007b).

3.3.6.3.1 Pismo and Carpenter Creeks

The Pismo Creek channel/lagoon system trends southerly but does not typically drift as far south as Carpenter Creek. The lagoon varies in size and length yearly, with the break in the barrier beach generally occurring one to several hundred yards south of Addie Street. At high tide, saltwater flows into Pismo Creek for nearly 0.5 miles upstream to a grade-control structure that begins at the Highway 101 overpass.

In the Pismo Creek Lagoon (an estuarine system), the available tidewater goby habitat encompasses approximately 24 acres. Tidewater gobies were present in Pismo Creek Lagoon during surveys in September 2007 (Rischbieter, Douglas, pers. comm. 2007); February 2008 (Swift, C., pers. comm. 2008); March, July, and October 2011 (Rischbieter, Douglas, pers. comm. 2011a, Rischbieter, Douglas, pers. comm. 2011b, Rischbeiter 2011c); April 2012 (Rischbieter, Douglas, pers. comm. 2012); and throughout 2017 to 2024 (Rischbieter, Douglas, pers. comm. 2024b) The small Carpenter Creek population is generally considered an extension of the population in Pismo Creek. While Carpenter Creek was almost always associated with and tributary to the Pismo Creek lagoon and outlet, it now has not been in recent years and since 2023 has been essentially functioning as a "second outlet" (diversion) of Meadow Creek. Tidewater gobies have been observed in Carpenter Creek every year for over a decade (Rischbieter, Douglas, pers. comm. 2024b)

3.3.6.3.2 Arroyo Grande and Meadow Creeks

In 1961, Arroyo Grande Creek was channelized from Los Berros Creek downstream to the Pacific Ocean with the development of levees to control flooding (Waterways Consulting, Inc. 2010). The Arroyo Grande Creek and Estuary typically consists of three distinct aquatic habitats: an upstream riverine environment characterized by a series of short low-gradient riffles and shallow (less than 3 feet) pools, runs, and glides that flow westward; a several-acre L-shaped estuarine lagoon (also synonymous with estuary) behind the beach and along the end of a levee; and, when the lagoon is draining to the ocean, a few hundred feet of transitory low-complexity, relatively shallow channel that connects the lagoon to the surf line, characterized by sand banks and substrate. The northeast/upstream end of the lagoon and both sides of the upstream reach are confined by levees. Patches of submerged and emergent aquatic vegetation and varying substrates of mud, silt, and gravel characterize the lagoon. The upper lotic (i.e., area of flowing water) reach is usually characterized by dense riparian vegetation on and overhanging the banks, predominantly small-gravel and sand substrate, and a sparse distribution of large woody debris.

Tidewater goby were first observed in Arroyo Grande Creek and Estuary in February 2005 (Rischbieter 2006) and have been thriving there since then despite what have been one or two local extirpation and recolonization events (Table 3-14). In-depth fishery sampling in 2004 was relatively extensive; thus, the species is presumed to have been absent in 2004, and its occurrence in 2005 is assumed to be the result of a recent colonization. There is no known record of their collection here at any earlier time.

The lower 1 mile of Arroyo Grande Creek including the Arroyo Grande Estuary are located within Pismo State Beach. As discussed previously (section 3.1.3), the lower portion of Arroyo Grande Creek and

Estuary are heavily impacted by water uses upstream (including unregulated groundwater pumping), which in dry years result in dry creek beds and a greatly reduced lagoon (Rischbieter 2010). Periodic sampling for tidewater goby suggests their presence in Arroyo Grande Estuary can be variable and tenuous depending on conditions (Rischbieter 2009a, 2009b). Although found to be common in February 2008 (Swift, C., pers. comm. 2008), no tidewater gobies were collected in surveys in September and December 2008 or in four sampling efforts in 2009 (Rischbieter 2009a, 2009b). Droughts in 2008 and 2009 likely resulted in near-complete fish-kills, and tidewater goby was thought to be extirpated from the estuary at that time (Rischbieter 2009a, 2009b). Specifically, the complete desiccation of the estuary and nearby upstream area due to groundwater overdraft during a very dry summer was likely responsible for the apparent extirpation in 2008 and 2009 (Rischbieter 2009a, 2009b). Tidewater gobies recolonized Arroyo Grande Creek and Estuary in 2010, and a small amount of freshwater inflow occurring as late as August 2010 likely allowed fish species to persist through the summer (Rischbieter 2010). Since then, tidewater goby had a resurgence, numbering in the 1,000s in 2013 and 2014 despite the drought conditions (Table 3-14; (Rischbieter 2013). Tidewater goby was not found during surveys conducted in December 2015 or February 2016, but otherwise dozens to thousands were observed throughout the estuary later in 2016 and during virtually all of the surveys conducted 2017 to 2023 (Table 3-14, (Rischbieter 2017, 2018, 2023)

Tidewater goby was also found in July 2014 in Meadow Creek upstream of the flood control flapgates separating Arroyo Grande Creek and the Meadow Creek watershed (Rischbieter 2014). However, stream conditions in 2015 were persistently the driest observed at Arroyo Grande Creek since CDPR began tidewater goby monitoring in 2003 (i.e., there was no lotic stream habitat present on any survey date), and surface inflow to the large, persistent lagoon pool was absent essentially all year. Lagoon water quantity and quality progressively declined over the 2015 survey period, but never reached the near-complete desiccation observed in 2008 and 2009. Immediately preceding the last 2015 survey in December, a surge of seawater (i.e., high tides and surf over about 2 days) apparently caused a large-scale displacement of the previously-established and drought-enduring fishery. This 2-day event seemed to impact the lagoon ecosystem even more significantly than had the severe 2014–2015 drought conditions, so much so that the entirety of the Arroyo Grande Creek and Estuary fish community suffered a severe decline (Rischbieter 2016). The tidewater goby population subsequently recovered in Arroyo Grande Creek, in some years even being incidentally captured in lotic Arroyo Grande Creek as far upstream as Guiton Crossing; a few individuals were also subsequently and intermittently captured in lower Meadow Creek. However, a 2021-2022 non-DPR construction project at the South San Luis Obispo Sanitation District (immediately adjacent to Meadow Creek) again dried-up lower Meadow Creek as a result of construction site dewatering activities, and tidewater goby is not known to have reestablished presence in that watershed (Rischbieter 2022, 2023, Rischbieter, Douglas, pers. comm. 2024b)

The available tidewater goby habitat in Arroyo Grande Creek encompasses approximately 19 acres and is entirely within or adjacent to the HCP area. At least 18 other species of fish have been documented using this habitat (Rischbieter 2009a, 2011), including introduced warm water sport fish such as largemouth bass and various other sunfish. Arroyo Grande Creek and Estuary is separated from the Meadow Creek drainage to the north by a levee and flood control gates (Rischbieter 2010, Waterways Consulting, Inc. 2010). When Meadow Creek levels rise, the floodgates open and the opportunity arises for invasive species to make their way into Arroyo Grande Estuary (Rischbeiter 2011c). Existing fisheries survey permitting authority does not specifically authorize removal of invasive predatory species upon collection. Surface water diversions and especially groundwater pumping have been blamed for the occasional dewatering of habitat in the lower reaches of this stream. Unregulated groundwater pumping perennially creates a significant cone of depression adjacent to Arroyo Grande Creek immediately upstream from the park boundary (Fugro Consultants 2014, 2015, GSI Water Solutions, Inc. 2018), and it

is believed that the surface waters of lower Arroyo Grande Creek are occasionally 100 percent consumed by this persistent and recurring well-induced feature.

3.3.6.3.3 Oso Flaco Creek

The USFWS has identified approximately 0.7 acre of available, potential tidewater goby critical habitat in what the USFWS calls the "Oso Flaco Lagoon" (USFWS 2005a). A true lagoon appears to form here rarely, but it is hydrologically associated with Oso Flaco Lake and its outlet stream when present. Historically, tidewater goby had not been known to occur in the lake or creek until the first such collection in March 2017, when two adult tidewater gobies were collected within a short reach extending from the surf zone to where Oso Flaco Creek exits the dunes (Rischbieter, Douglas, pers. comm. 2017). A few additional positive collections have been made in some intermittent years since then, including 2023, when successive surveys indicated that at least a couple of individuals had apparently persisted in lower Oso Flaco Creek for several months (Rischbieter, Douglas, pers. comm. 2024b). In the absence of a true and persistent lagoon, CDPR does not consider the creek habitat to be suitable for goby in most years. The Oso Flaco Lake fishery is dominated by warm water sport fish, such as largemouth bass and sunfish, and the creek is narrow and confined (Rischbeiter 2011c). The creek only rarely impounds to form a true lagoon, and as a result, there is a large freshwater influence with no saltwater prism. While this area appears to be poor long-term habitat for tidewater goby, an eDNA survey was conducted by a U.C. Los Angeles doctoral student Mira Abrecht in February 2024 to investigate whether tidewater goby may occupy the difficult-to-access short reach of stream between Oso Flaco Lake and the beach location where tidewater goby have occasionally been collected. Results were reported in January 2025. 12S eDNA metabarcoding of water and sediment samples indicate tidewater goby presence in several systems within Pismo State Beach and Oceano Dunes SVRA, including Pismo Creek, Carpenter Creek, Meadow Creek, Arroyo Grande Creek, and Oso Flaco Creek. These detections, as well as detections of other fish species, were consistent with results of seines run concurrently to environmental sample collection. However, the novel observation of tidewater gobies in Oso Flaco Lake may require further investigation due to possible sample contamination (Abrecht and Jacobs 2025).

3.3.6.4 Tidewater Goby Regulatory Status, Recovery Plan, and Critical Habitat

The State of California listed the tidewater goby as a species of special concern in 1980. The USFWS listed the tidewater goby as an endangered species in 1994 (USFWS 1994). The USFWS 12-month finding, completed in March 2014, concluded with a proposed rule that the species be downlisted to threatened (USFWS 2014c); however, it is still listed as endangered, and the USFWS has not finalized the downlisting. The USFWS published the final designated critical habitat in 2008 (USFWS 2008a); the USFWS revised the critical habitat in 2013 (USFWS 2013d).

The USFWS final designation of critical habitat for tidewater goby (USFWS 2013d) includes 20 acres in Pismo Creek Lagoon (Unit SLO-11; Map 17). USFWS determined this area was threatened by coastal development, channelization, and non-point and point source pollution (USFWS 2013d). The USFWS also included a critical habitat unit at Oso Flaco Lake (Unit SLO-12). The unit encompasses approximately 171 acres and consists of 140 acres of CDPR lands and 30 acres of private lands. The USFWS defined this critical habitat unit as an area that is "outside the geographical area occupied by the species at the time of listing, is not known to be currently occupied, and [that] there are no historical tidewater goby records for this location" (USFWS 2013d). However, the USFWS found this unit is essential for the conservation of the species because "it provides habitat to nearby occupied units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region" (USFWS 2013d). It is suspected that this unit has the potential to provide habitat for tidewater goby that disperse from Arroyo Grande Creek and the Santa Maria River

and allow for connectivity between populations; however, water quality impairments may prevent tidewater goby from establishment at this area.

The USFWS issued the final Recovery Plan for the tidewater goby in 2005 (USFWS 2005a). The HCP area occurs within Sub-Unit CO1 of the Conception Recovery Unit. The Conception Recovery Unit begins south of the promontory of Point Buchon (a headland just south of Montana de Oro State Park), extends all the way around Point Conception, and is bounded to the south and east of the Santa Barbara coast, ending at the southern Ventura County line. Sub-Unit CO1 extends between Point San Luis and Point Sal and consists of a largely sandy shoreline. Four localities in this sub-unit currently have tidewater gobies: San Luis Obispo Creek, Pismo Creek, Arroyo Grande Creek, and the Santa Maria River (USFWS 2005a, Swift, C., pers. comm. 2008). Only Pismo Creek and Arroyo Grande Creek are located in the HCP area. Based on the apparent genotypic distinction of populations in this region, effort to reestablish tidewater gobies in other coastal habitat, such as near Oso Flaco Lake, is recommended (USFWS 2005a). As noted above (section 3.3.6.3.2), however, this area would most likely be poor long-term habitat for the tidewater goby.

The overall recovery strategy contained in the USFWS Recovery Plan for the Tidewater Goby (USFWS 2005a) involves the following:

- Monitor, protect, and enhance current habitat conditions for extant populations
- Conduct research to acquire additional information needed for management
- Restore degraded habitats to suitable conditions and reintroduce or introduce tidewater gobies to those habitats
- Develop and implement an information and education program

3.3.6.5 Suitable Habitat in the HCP Area

Suitable tidewater goby habitat was mapped based on the areas in the HCP area known to be occupied by tidewater goby (Map 17). Tidewater goby is known to occur in Pismo Creek Lagoon, Arroyo Grande Creek and Estuary, and occasionally in lower Carpenter Creek and lower Meadow Creek. Tidewater gobies have been observed occupying habitat throughout the estuary, typically areas with a freshwater-saltwater interface. Tidewater gobies are typically found upstream a short distance into freshwater and downstream into water of up to about 80 percent sea water or 28 ppt (Worcester 1992, Worcester and Lea 1996). Map 17 shows tidewater goby occupied habitat at the Pismo Creek Lagoon and Arroyo Grande Creek and Estuary. The occupied habitat was mapped using aerial imagery (National Agricultural Imagery Program 2022) and the location of tidewater goby habitat identified from tidewater goby field surveys that have been conducted since 2003 (Rischbieter 2023). Potential occupied habitat was not mapped at Oso Flaco Lake and Oso Flaco Creek, as a true lagoon/estuary has too rarely been observed in this area, and there is a large freshwater influence with no salt-water prism (section 3.3.6.3.2). A total of 45 acres was mapped as suitable tidewater goby habitat in the HCP area.

Table 3-14. Results from Surveys for Tidewater Goby at Arroyo Grande Creek, 2005–2023

Year	Months Surveys Conducted	Range in No. of Tidewater Goby Observed	
		Low	High
2005	March[1], Aug., Dec.	0	Abundant[2]
2006	Feb., June, Sept., Dec.	0	1
2007	April, June, Sept., Dec.	Few[3]	Abundant

Table 3-14. Results from Surveys for Tidewater Goby at Arroyo Grande Creek, 2005–2023			
Year	Months Surveys Conducted	Range in No. of Tidewater Goby Observed	
		Low	High
2008	March, June, Sept., Dec.	0	Few
2009	April, June, Aug., Oct.	0	0
2010	April, June, Aug., Oct.	2	9
2011	March, June, July, Oct.	0	6
2012	April, June, July, Sept.	Few	100,000s
2013	April, May, July, Sept.	Few	1,000s
2014	April, May, July, Sept.	Dozens	100s
2015	Feb., April, June, Aug., Oct., Dec.	0	1,000s
2016	Feb., April, July, Oct., Dec.	0	Dozens
2017	March, June, July, Oct.	Dozens	10,000s
2018	Feb., April, July, Oct.	100s	1,000s
2019	Feb., April, July, Sept.	Dozen	1,000s
2020	April, June, Sept., Nov.	Dozens	10,000s
2021	Feb., July, Oct.	Few	1,000s
2022	Feb., June, Sept., Dec.	0	1,000s
2023	Feb., May, Aug. Nov.	1	100s

Notes:

[1]March 2005 is the first observation of tidewater goby at Arroyo Grande Creek.

[2]"Abundant" = essentially unavoidable (present in all or most seine hauls), collected in numbers that make it the most or one of the most common/abundant species present at the time (usually many-tens or dozens at a time)

[3]"Few" = never more than single digits in any seine haul, and some seine hauls without any of that species

Sources: Rischbieter Lower Arroyo Grande Creek Survey Reports (2006) through (2020a), Rischbieter Aquatic Survey Reports (Rischbieter 2020b, 2021, 2022, 2023)

3.4 Listed Plant Species

This HCP includes six plant species that are listed under CESA and/or FESA (Table 1-1) and are present within the HCP area. Of the six listed plant species, four are listed as federal endangered as well as state-listed (state endangered or threatened), and two are only state threatened. Although FESA does not prohibit take of listed plant species, the Oceano Dunes District has included them in this HCP and requests assurances for them under USFWS's "No Surprises" assurances rule, discussed in section 6.5.2.

Habitat for each listed plant species was mapped (Map 18) by identifying the vegetation alliances described in section 3.1.5.1 that could be associated with each plant species. Alliances were mapped as suitable habitat for each listed plant species if the particular plant species was found to occur in that alliance in the HCP area. Alliances were also mapped as suitable habitat if the CNDDB occurrence records from outside the HCP area identified additional vegetation alliances, as indicated by commonly associated species. Refinements between each listed plant species and vegetation alliances were also identified based on the scientific literature, recovery plans, critical habitat designation, USFWS 5-year reviews, and the best professional judgment of CDPR staff with experience working with the covered species in the HCP area.

Listed plant species occurrence data were reviewed and used to prepare the following sections. Two primary sources of spatial (GIS-based) data were used: (1) plant species occurrence data collected by CDPR during various surveys in portions of the HCP area and (2) CNDDB occurrence data (CNDDB 2024). Listed plant occurrence data collected during various surveys in portions of the HCP area were either recorded on field maps to be digitized or recorded using a Global Positioning System (GPS) unit.

The following sections use different terms to describe groupings of the same species of plants to be consistent with the terms used by CNDDB and USFWS (e.g., in the USFWS 5-year reviews for La Graciosa thistle (USFWS 2011c), Nipomo Mesa lupine (USFWS 2009b), marsh sandwort (USFWS 2008b), and Gambel's watercress (USFWS 2011c), and to identify smaller groupings of plants in and adjacent to the HCP area during survey efforts by the Oceano Dunes District and other entities (e.g., the Land Conservancy of San Luis Obispo [LCSLO]).

- The term "occurrence" is used to be consistent with the definition used by CNDDB and as used in the 5-year reviews, which is an individual or group of individuals within 0.25 mile and not separated by significant habitat discontinuities (CNDDB 2024).
- The term "population" refers to a group of interbreeding individuals. A single population may include one or more occurrences.

3.4.1 Marsh Sandwort (*Arenaria paludicola*)

Marsh sandwort is a perennial herb in the pink family (Caryophyllaceae). It has rooting, trailing stems and small white, inconspicuous flowers that bloom from May through August. It can also reproduce asexually by producing adventitious roots on the trailing stems that come in contact with suitable conditions.

3.4.1.1 Regulatory Status, Recovery Plan, and Threats to the Species

Marsh sandwort was listed as a state endangered species in 1990 and as an endangered species by the USFWS in 1993 (USFWS 1993). Marsh sandwort is one of two species addressed in the 1998 Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Nasturtium* [*Rorippa*] *gambelii*) (USFWS 1998). An amendment to the recovery plan was published in 2019 (USFWS 2019c). Recovery objectives for these species include the following:

- Protect, maintain, and enhance habitats
- Monitor and document species populations and habitat characteristics
- Conduct research on the ecology and biology of the species
- Expand existing populations
- Establish new populations
- Evaluate progress and update management and recovery guidelines

The USFWS conducted a 5-year status review of marsh sandwort in 2020 to determine whether the federal listing status should be considered for change (USFWS 2020c). As a result of this 5-year review, no change in status was recommended. Likewise, no change to its CESA listing status is proposed, and no critical habitat has been designated for this species.

The primary threats to the continued existence of marsh sandwort include: (1) habitat modification by converting marsh habitat to mesic upland habitats that support grass and shrub-dominated plant communities; (2) increased sedimentation caused by urbanization; (3) alteration of the hydrological

regime; (4) herbivory by mammals; (5) water quality issues (e.g., excessive nitrogen); (6) climate change; and (7) sea-level rise (USFWS 2016c).

3.4.1.2 Regional Distribution and Abundance

Historically, this species occurred in swamps, marshes, and other wet areas in widely disjunct localities in California and Washington between sea level and 1,000 feet. In California, historical populations are known from five areas: San Francisco Bay (Crissy Field, San Francisco County), Santa Cruz (Scotts Valley, Santa Cruz County), Guadalupe-Nipomo Dunes (Black Lake, Black Lake Canyon, Jack Lake, Oso Flaco Lake, Twin Lake, and Pismo Beach, San Luis Obispo County), Los Angeles (Los Angeles basin, Los Angeles County), and along the Santa Ana River (vicinity of San Bernardino, San Bernardino County) (USFWS 2016c). Marsh sandwort typically occurred on saturated, acidic bog soils that were predominantly sandy with a high organic content (USFWS 1998). Currently, its primary habitat consists of boggy areas in freshwater marshes and swamps below 560 feet in elevation (USFWS 2008b). Marsh sandwort is found with dense mats of rushes, cattails, bur-reed (*Sparganium* spp.), and bulrush (USFWS 2008b).

When it was federally listed in 1993, marsh sandwort was only known from one extant population near the San Luis Obispo County coast at Black Lake Canyon on the Nipomo Mesa (Table 3-15). Naturally occurring plants had last seen at Black Lake Canyon in 1994 after a steady decline since 1985 (USFWS 1998). However, marsh sandwort was rediscovered in Black Lake Canyon approximately 1.5 miles east of Black Lake in 2020 (occurrence 5 [MASA5] in Table 3-15). The species has been reintroduced to Black Lake on three different occasions, but attempts were unsuccessful, with the last observation recorded in 1999 (occurrence 4 [MASA4] in Table 3-15). Marsh sandwort has also been introduced to the Sweet Springs Audubon Nature Preserve in Los Osos in San Luis Obispo County in 2003 (USFWS 2008b, CNDDB 2024). Approximately 200 marsh sandwort propagules were outplanted at six unnamed ponds and marshes on the Guadalupe-Nipomo National Wildlife Refuge in October 2008 (USFWS 2016c). While most survived the move, grazing mammals consumed nearly all the plants within 2 years (USFWS 2016c). In August 2013, an additional 90 marsh sandwort propagules were outplanted at the Guadalupe-Nipomo National Wildlife Refuge (USFWS 2016c). Exclusion fencing minimized the threat to the plants from herbivory by mammals, and at least 50 percent survived through at least October 2013. Their current status on the Guadalupe-Nipomo National Wildlife Refuge is unknown (USFWS 2016c). Furthermore, an outplanting effort of 40 individual plants was conducted in the 2021 in the Los Osos Creek watershed near the town of Los Osos by the Coastal San Luis Resource Conservation District staff and as of January 2024, 5 individual plants remained (Samantha Alvarez Coastal SL RCD. 2024).

Additional reintroduction efforts of marsh sandwort have occurred at Wilder Ranch/Baldwin Creek in Santa Cruz County, California, and the Rodeo Creek and Miwok watersheds in the Golden Gate National Recreation Area in San Francisco County, California (National Park Service 2016, USFWS 2016c). The marsh sandwort plants at the Golden Gate National Recreation Area appear to be stable at all locations (National Park Service 2016). As of 2016, the two sites in Golden Gate National Recreation Area supported outplanted marsh sandwort individuals (National Park Service 2016). While marsh sandwort plants are still extant at Baldwin Creek sites, it is too early to determine if these plants will establish and will be successful in the long term (USFWS 2016c).

After marsh sandwort was federally listed, a natural population was rediscovered in the HCP area at Oso Flaco Lake in 1998 (Map 19). Chestnut (1998) reported marsh sandwort from two locations, separated by approximately 330 feet, in a marshy area near the northeast corner of Oso Flaco Lake. The larger of the two locations contained at least 65 plants, and the smaller location was comprised of at least 20 plants. The plants were growing in an area dominated by broad-fruited bur-reed (*Sparganium eurycarpum*) and appeared to be especially associated with Cusick's sedge (*Carex cusickii*)—a large, tussock-forming species of localized occurrence in this area. This site now comprises the only known

extant, wild population. This population has been in decline since 1998, however, with only 25 clumps reported in 2005 (CNDDB 2024). A decline in habitat quantity and quality was recorded at this site in late 2006 (CNDDB 2024). The vegetation at this location was observed to be thicker, denser, and more overgrown, consistent with biostimulation. Development and agricultural operations upstream from the lake have indirectly caused a decline in the quality of the marsh and swamp habitat through increases in nutrients (USFWS 2008b). A survey by CDPR contractors for marsh sandwort was attempted in 2013. Surveyors could not confirm presence of the plant due to problems with accessibility but did determine that habitat, including the sedge (*Carex*) mat microhabitat used by this species, is still present in locations where marsh sandwort was observed in the past (MIG 2015). The area was surveyed in June and September 2018 (J. Chestnut, pers. comm. 2019). Surveyors found marsh sandwort growing in a narrow band just outside the overhead willow canopy and shoreward from the tule marsh that dominates that portion of the lake. They noted that in this narrow band, Cusick's sedge formed floating clumps that provided a substrate for the marsh sandwort to grow over. Although specific numbers of individuals or population acreage was not determined, it appeared the tule coverage had expanded compared to previous visits, and the habitat band for the sandwort was in turn shrinking (J. Chestnut, pers. comm. 2019). In 2020 and 2022, CDPR staff surveyed this occurrence and confirmed continued presence of marsh sandwort at both locations. Two small patches with approximately 5-25 individuals in each location were observed in July 2020, and 2 additional plants were found in October 2020 in the eastern location. In August 2022, both locations had approximately the same number of live plants compared to 2020, covering a similar footprint. However, due to the dense cover of the supporting *Carex* structure, it could not be determined how many plants were present. Marsh sandwort stems visible above the *Carex* mat substrate was estimated to be 100+ stems in the western location and 50+ stems in the eastern patch had (Table 3-16).

Outplanted individuals (described above) are not included in Table 3-15 below. All other previously reported populations within the HCP boundary (i.e., 13 since 1899) are considered extirpated or presumed extirpated (CNDDB 2024).

3.4.1.3 Suitable Habitat in the HCP Area

Suitable habitat for marsh sandwort was modeled for the HCP area using known habitat requirements for the species: all perennial wetlands, including freshwater marshes (fens), slow moving creeks in open places in peat; and possibly in brackish waters (USFWS 1998). For this HCP, CDPR mapped a total of 11 acres as suitable marsh sandwort habitat in the HCP area.

Table 3-15. Marsh Sandwort Occurrences In* and Near the HCP Area (Map 19)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
MASA1*	3	1993	0	CNDDB: Extirpated	CNDDB: Site known from a 1950 collection. No plants found in 1987 and 1993. This occurrence is classified as Extirpated in the CNDDB database.
MASA2*	9	2022	150+ stems	CNDDB: **Presumed extant**	CNDDB: 85 plants observed in 1998. Approximately 25 clumps seen in 2005; unknown number observed in 2001, 2006, and 2018. This is the last remaining naturally occurring population known within the HCP boundary based on CNDDB data.

Table 3-15. Marsh Sandwort Occurrences In* and Near the HCP Area (Map 19)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
					CDPR: CDPR survey attempted in 2013, but site was inaccessible. Suitable habitat appeared present. Unknown number of plants present in 2018 (J. Chestnut, pers. comm. 2018); observed narrow band shoreward from tule marsh. Two small patches with approximately 5-25 individuals in each were observed in July 2020 and 2 additional plants found in October 2020 at this location. These patches were also observed in August 2022, one patch with 100+ stems and one with 50+ stems; dropping water levels, encroachment of tules, willows, and cattails were cited as threats. This assessed habitat band appears to be shrinking, likely due to riparian vegetation expansion.
MASA3*	7	1998	0	CNDDB: Possibly extirpated	CNDDB: Jack Lake. Very few plants found in 1964. Area visited in 1987 and 1998 but no plants found. Lake overgrown so primary habitat no longer exists.
MASA4*	4	1999	0	CNDDB: Possibly extirpated	CNDDB: 9 plants transplanted to Land Conservancy easement of Black Lake; none surviving in 1999.
MASA5	5	2020	3+	CNDDB: **Presumed extant**	CNDDB: 3+ plants, mapped as 3 different polygons in 2020.
MASA6	6	1987	Unknown	CNDDB: Extirpated	CNDDB: Site known from a 1947 collection. No plants found in 1987.
MASA7	12	1965	Unknown	CNDDB: Possibly extirpated	CNDDB: Site known from a 1965 collection. Herbarium label indicates in marshy willow thickets along creek next to State Park Campground.
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area. **Bold** indicates population is extant or presumed extant.					

3.4.2 La Graciosa Thistle (*Cirsium scariosum* var. *loncholepis*)

La Graciosa thistle is a bushy biennial or short-lived, perennial herb with large, smooth to slightly hairy leaves and clustered heads of white flowers. Flowering May–August, it is a spreading, mound-like or erect plant in the sunflower family (Asteraceae) that is well armored with spines on the leaves and flower heads. This species thrives on sandy soils and is pollinated by hummingbirds and insects (USFWS 2000b, USFWS 2009c). The variety and abundance of pollinators indicate that this species is a generalist (i.e., utilizes a wide variety of pollinators).

3.4.2.1 Regulatory Status and Threats to the Species

La Graciosa thistle was listed as a state threatened species in 1990 and a federal endangered species in 2000 (USFWS 2000b). Several taxonomic revisions were made for this species since that date and *C. loncholepis* is currently recognized by the scientific name *Cirsium scariosum* var. *loncholepis*.

The USFWS determined that existing La Graciosa thistle populations were threatened by direct and indirect effects from energy-related operations (e.g., maintenance activities, hazardous waste cleanup), development that results in additional habitat modification (e.g., agricultural and urban development), facility accidents by oil companies or VSFB, groundwater extraction and other hydrologic alterations, direct and indirect effects from OHV activity, small population size, habitat fragmentation, loss through the invasion of aggressive invasive weeds, and climate change (USFWS 2000b, USFWS 2009c, USFWS 2011d).

A recovery plan for La Graciosa thistle was published in 2021 (USFWS 2008c). The following recovery objectives are provided the recovery plan:

- To increase the species' resiliency, redundancy and representation to ensure the species' long-term viability
- Habitat restoration and outplanting at the existing occurrences and
- Re-establishment of several independent occurrences throughout most of the population units

Critical habitat for La Graciosa thistle was designated in 2009 (USFWS 2009c). The USFWS-designated critical habitat in the HCP area includes the vegetation islands and adjacent open dunes in order to account for movement of vegetation islands over time at an estimation of approximately 1.6 feet per year (USFWS 2009c). However, the USFWS mapping only accounted for movement over 20 years.

3.4.2.2 Regional Distribution and Abundance

This species is known from coastal San Luis Obispo and Santa Barbara counties from Pismo Beach south to Los Alamos in Santa Barbara County. In general, La Graciosa thistle is associated with backdune and coastal wetlands on the margins of dune swales, dune lakes, marshes, estuaries, coastal meadows, seeps, springs, intermittent streams, creeks, and rivers (USFWS 2009c). The distribution of individual plants within populations is often an elongated pattern that is consistent with seed dispersal caused by the prevailing coastal winds (USFWS 2001b). It is often found in a mat of low-growing herbaceous plants, including rushes, sedge, salt grass (*Distichlis spicata*), Bermuda grass (*Cynodon dactylon*), clover (*Trifolium wormskioldii*), yerba mansa (*Anemopsis californica*), silverweed (*Potentilla anserina*), and birdfoot trefoil (*Lotus corniculatus*; (USFWS 2001b)).

The Santa Maria River mouth area supports the largest concentration of this species, which is most frequently found in grassy patches on the upper margins of marshes associated with the Santa Maria River estuary. Floods in 1998 greatly reduced the number of La Graciosa thistle plants in that area (USFWS 2000b). Since federal listing, populations of this species have severely declined. CNDDB currently reports 8 occurrences to be presumed extant; however, at the time of listing, the USFWS believed there were 11 extant occurrences distributed among 7 populations (USFWS 2000b). At that time, the extant occurrences ranged from the northern Callender Dune Lakes in the Callender Dunes to the seeps at Cañada de las Flores. At the time of the most recent USFWS 5-year review (USFWS 2019a), however, La Graciosa thistle was considered to have five extant occurrences, including southern Callender Dunes Lake, southern Guadalupe Dunes, and the Santa Maria River (Table 3-16). One of these occurrences (i.e., southern Guadalupe Dunes) is within the HCP area and is extant (Map 20). Surveys as recently as 2023 confirmed the presence of La Graciosa thistle in the South Oso Flaco area at Surprise Lake. CDPR conducted reconnaissance surveys in 2022 at LGTH3, LGTH4, LGTH 5 and LGTH6and did not

find any La Graciosa thistle individuals. Due to increased vegetative cover and decreased water levels at these locations in recent years, the habitat has become increasingly less suitable for La Graciosa thistle and these occurrences appear to be extirpated (Wagner, Ben, pers. comm. 2024).

Table 3-16. La Graciosa Thistle Occurrences In* and Near the HCP Area (Map 20)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
LGTH1	11	2019	600	CNDDB: **Presumed extant**	CNDDB: ~245 plants in 2017. NW end of Small Twin Lake: 41 in 2018 and 600 in 2019. CDPR: <10 plants observed in 1981; 10-50 plants observed in 1984; 20 seen in 1988.
LGTH2	10	2017	0	CNDDB: Possibly extirpated	CNDDB: <10 plants seen in 1981; 100+ plants seen in 1983, none found in 1986. Populations fluctuate greatly from year to year. No plants observed in 2017.
LGTH3*	8	2017	0	CNDDB: Possibly extirpated	CNDDB: None seen in 1998, 2015, 2017. CDPR: Occurrence is small: only 1 flower plants, 3 seedlings, and 44 vegetative plants seen in 1990; one severely damaged plant was found 100 m east of the main population. Only 2 plants observed in 1998 and none in 2015 or 2022. Presumed extirpated.
LGTH4*	20	2017	0	CNDDB: Possibly extirpated	CNDDB: General SE polygon: Unknown number of plants at Lettuce Lake, mentioned in a 1980 McCoy report; no plants seen in 1998 or 2017. NW polygon: 12 plants observed in 1990; no plants seen in 1998, 2015, or 2017. CDPR: 11 plants observed in 1990. No plants seen in 1998, 2015, or 2022. Presumed extirpated.
LGTH5*	13	2015	0	CNDDB: Possibly extirpated	CDPR: 34 plants found in two colonies in 1990. None seen in 1998,2015 and 2022. Presumed extirpated.
LGTH6*	30	2017	0	CNDDB: Possibly extirpated	CDPR: None seen in 2022 in reconnaissance surveys. Presumed extirpated. CNDDB: Only source of information for this site is 1975 collection by Keefe. No plants seen in 2015 or 2017.

Table 3-16. La Graciosa Thistle Occurrences In* and Near the HCP Area (Map 20)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
LGTH7*	12	2023	14	CNDDB: **Presumed extant**	CNDDB: 37 in 2016, 65 in 2017, 0 in 2018, and 15 in 2019. CDPR: Surprise Lake. Fewer than 50 plants found in 1981; none found in 1986; 50 in 1987; 27 in 1990, 54 in 1997; 7 on N side in 1998 (none on E side). 10 in 2008; 37 in 2013, 1 in 2015, 8 in 2017, 17 in 2020, 45 in 2021, 12 in 2022, and 14 in 2023.
LGTH8	31	2019	64	CNDDB: **Presumed extant**	CNDDB: 87 plants in 1997; 50 plants in 2007; an unknown number of plants seen in 2008; 300 in 2010; 172 in 2013, 10 in 2014. At least 5 plants (with seed heads) in 2017 (fenced area no longer contained plants). An unknown number of plants were seen in 2018, and 64 were seen in 2019.
LGTH9	32	2017	0	CNDDB: Possibly extirpated	CNDDB: 420 plants in 2005; 280 in 2006; 119 in 2007; 94 in 2008; 23 in 2009; 34 in 2010; 35 in 2011; 18 in 2012; 12 in 2013; 1 in 2014. Fence installed to protect plants from cattle. However, feral pigs have been invading the Guadalupe Dunes and are causing damage to many areas. No plants in 2015, 2016, or 2017.
LGTH10	18	2019	212	CNDDB: **Presumed extant**	CNDDB: 137 plants in 1990; 31 in 1995 in 3 subpopulations. Unknown no. in 2000-2002; 2240 in 2006; 1558 in 2007; 1005 in 2008; 280 in 2009; 240 in 2010; 247 in 2011; 649 in 2012; 2812 in 2013; 23,500 in 2014; 5374 in 2015; 803 in 2016; 913 in 2017; and 212 in 2019.
LGTH11	6	2019	199	CNDDB: **Presumed extant**	CNDDB: Gen. pop numbers for portions of site: 1000-10,000 plants in 1983; ~6000 in 1986; 54,000 established in 1990; 1746 in 2006; 1339 in 2007; 8362 in 2008; 9751 in 2009; 4464 in 2010; 3861 in 2014; 2833 in 2015; 1510 in 2016; seen in 2017; 199 in 2019.
LGTH12	19	2017	0	CNDDB: Possibly extirpated	CNDDB: 100 plants estimated in 1991; no plants seen in 2017.
LGTH13	28	2017	0	CNDDB: Possibly extirpated	CNDDB: Only source of information for this site is 1983 collection by Bevier. Plants uncommon. None seen in 2005, 2013 or 2017.

Table 3-16. La Graciosa Thistle Occurrences In* and Near the HCP Area (Map 20)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area. Note: CDPR surveys LGTH 7 annually. CDPR conducted reconnaissance surveys in 2022 at LGTH3, LGTH4, LGTH 5, and LGTH6 and did not find any La Graciosa thistle individuals. **Bold** indicates population is extant or presumed extant.					

3.4.2.3 Suitable Habitat in the HCP Area

La Graciosa thistle habitat was modeled by CDPR in the HCP area using known habitat requirements for the species. This species has historically been treated as a lowland, coastal wetland species; therefore, dune wetlands and moist areas were identified as suitable habitat as shown in Map 18. For this HCP, CDPR mapped a total of 549 acres as suitable La Graciosa thistle habitat in the HCP area.

3.4.3 Surf Thistle (*Cirsium rhothophilum*)

Part of the sunflower family (Asteraceae), this species is a low-growing, short-lived perennial, usually living 2 **to** 3 years. Flowering occurs between April and June. It is characterized by large rosettes of spiny, white-woolly, deeply lobed and undulating leaves with white flowers in dense heads. The deep roots and white-woolly herbage are adaptations to the physical stresses of the dune habitat, such as high light intensity, sand movement and abrasion, and limited water (CDFG 2005). Surf thistle occurs only in the narrow strip of coastal habitat between stabilized dunes and windblown beach between 9 and 200 feet elevation (CDFG 2005).

3.4.3.1 Regulatory Status and Threats to the Species

Surf thistle was listed as a state threatened species in 1990. This species is not a federally listed species. In general, invasive plants, motor vehicles, and foot traffic threaten this species (CNPS 2024)

3.4.3.2 Regional Distribution and Abundance

This species is endemic to the dunes of the central California coast, from the Nipomo Dunes of southern San Luis Obispo County to Point Conception in Santa Barbara County, including populations within Pismo State Beach and Oceano Dunes SVRA (Map 21). It grows in coastal foredunes on the slopes of transverse ridges in areas of active sand accumulation. At the southern extreme of its range, it is found in sand at the bases or tops of cliffs (CDFG 2005).

Statewide, the CNDDB has 21 recorded occurrences of surf thistle, with 1 considered extirpated, 1 considered possibly extirpated, and 19 presumed extant. Most observations have been documented on the VSFB. Within the HCP area, surf thistle was observed near Oso Flaco Creek and in the foredunes of the South Oso Flaco area (MIG 2015) during vegetation mapping surveys conducted in 2012 and rare plant surveys conducted annually since 2013 (Table 3-17). Although surf thistle was previously documented in the North Oso Flaco Exclosure area, it has not been observed in this area since 2003 (CDPR 2008b).

Table 3-17. Surf Thistle Occurrences In* and Near the HCP Area (Map 21)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
SUTH1*	N/A	2013	0	N/A	CDPR: Extant Locally (L. Gardner, pers. comm. 2003); occurrence has not been observed since 2003. ST1 not present in this location 2013. North of known populations. No plants present at GPS point during 2013 survey. Unsuitable habitat.
SUTH2*	13	2014	0	CNDDB: Possibly extirpated	CNDDB: 9 plants seen in 1986, 4 in 1990. None found in 1995 or 1998. Most of the population believed to be extirpated by an experimental revegetation project.
SUTH3*	14 (4 parts)	2023	1,700	CNDDB: **Presumed extant**	4 polygons. CNDDB: 2015-06-11): 100+ plants observed in 1983. A few plants observed scattered through small transverse dunes in 1986. 85 plants in 1998. 296 in 2004. 2 middle polygons: 280 plants in 1998, 169 in 2008, 542 in 2012, approximately 1,623 in 2014, >1,600 in 2015, 1,298 in 2016, 1,483 in 2017, 1,263 in 2018, 1,449 in 2019. CNDDB: Southern polygon shows a reduction in size since 1986. CDPR: Northern polygon: 694 in 2013; 215 in 2014; 322 in 2015. From 2018 through 2023 polygons within HCP area (northern 3) surveyed only; total plant count was approximately 1,827 in 2018, 2,045 in 2019; 1,539 in 2020 (incomplete survey); 1,437 in 2021, 1,371 in 2022, and 1,700 in 2023, at various states of growth and senescence.
SUTH4	12 (2 parts)	1998	Unknown	CNDDB: **Presumed extant**	CNDDB: 2015-06-11): Reduction in size since 1986. 554 plants in 1990. Managed by the Nature Conservancy. Unknown number observed in 1998.
SUTH5	10 (3 parts)	1994	12	CNDDB: **Presumed extant**	CNDDB: 2015-06-11): 2 southern polygons: 1 plant observed in 1981 and 1986. 3 colonies mapped in 1981. Northern polygon: 11 plants observed in 1994.
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area. **Bold** indicates population is extant or presumed extant.					

3.4.3.3 Suitable Habitat in the HCP Area

CDPR modeled surf thistle habitat in the HCP area using known habitat requirements for the species. Modeled habitat includes sand dunes, mainly between the first set of dunes (unstabilized foredunes) and the stabilized dune areas (backdunes) (Map 18). For this HCP, CDPR mapped a total of 870 acres as suitable surf thistle habitat in the HCP area.

3.4.4 Beach Spectaclepod (*Dithyrea maritima*)

This species is a low growing, whitish-flowered perennial herb in the mustard family (Brassicaceae). The leaves are densely covered with grey hairs and are somewhat fleshy. The exposed stems are prostrate and less than 0.2 meter long, with the lower stems often under the sand (Al-Shehbaz 2017). The flowers are white to purple and can be seen from March to August (Al-Shehbaz 2017).

3.4.4.1 Regulatory Status and Threats to the Species

Beach spectaclepod was listed as a state threatened species in 1990. This species is not a federally listed species. Threats to the species include trampling by elephant seals (island occurrences) and humans, soil and water contamination, and invasive plants (CDFG 2005).

3.4.4.2 Regional Distribution and Abundance

Beach spectaclepod is found in small transverse foredunes within approximately 160–1,000 feet from the surf (CDFG 2005). Beach spectaclepod is usually found in areas of fragile dunes where the sand is relatively unstable. Historically occurring as far south as Los Angeles County and possibly Baja California Norte, Mexico, this species currently occurs in the dunes of San Luis Obispo and Santa Barbara counties and on San Nicholas and San Miguel Islands (CDFG 2005). At Oceano Dunes SVRA, beach spectaclepod is protected and monitored closely within the symbolic fence area in the foredune located just north and south of Oso Flaco Lake (Table 3-18 and Map 22; (CDPR 2015b, CDPR 2017b).

The CNDDB has recorded 28 occurrences of beach spectaclepod, with 3 considered extirpated and 25 presumed extant. At Oceano Dunes SVRA, beach spectaclepod was observed in the North Oso Flaco Exclosure area during vegetation mapping surveys conducted in 2012 (Table 3-18) and in the North and South Oso Flaco areas during rare plant surveys conducted since 2013 (Table 3-18).

Table 3-18. Beach Spectaclepod Occurrences In* and Near the HCP Area (Map 22)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
BESP1*	12	2023	175	CNDDB: **Presumed extant**	Eastern polygon: CNDDB: 2015-05-20): 54 plants in 1990; site is an experimental revegetation site. Northern polygon: CDPR: Extant Locally, (L. Gardner, pers. comm. 2003); occurrence has not been observed since 2003. Middle 2 polygons: 2013, 237 plants; 2014, 53 plants; 2016, 337 plants; 2017, 252 plants; 2018, 276 plants; 2019, 370 plants; 2020, 424 plants; 2021, 167 plants; 2022, 86 plants; 2023, 175 plants.

Table 3-18. Beach Spectaclepod Occurrences In* and Near the HCP Area (Map 22)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
BESP2*	25	2023	748	CNDDB: **Presumed extant**	CNDDB: 2019-03-26): Mapped by CNDDB as 7 polygons according to 2015-2019 digital data. Collections from dunes south of Oso Flaco Lake are also attributed to this site. CDPR: Burn transects: Northern polygon: 28 plants in 2008; approximately 101 in 2013; 20 in 2014; 6 in 2015. Middle polygon: 16 in 2004; 0 in 2008; approximately 115 in 2013; 0 in 2014; 368 in 2015. Southern 4 polygons: 16 in 2004; 269 in 2008; 327 in 2013; 289 in 2014; 342 in 2015; 713 in 2016; 538 in 2017; 529 in 2018; 1,079 in 2019; 1,091 in 2020 (incomplete survey); 1,153 in 2021; 471 in 2022; and 748 in 2023.
BESP3	24	1981	N/A	CNDDB: **Presumed extant**	CNDDB: 1999-01-19): Only source of information for this site is 1981 report and map by J. Vanderwier; unknown number of plants seen.
BESP4	10	2016	7,960	CNDDB: **Presumed extant**	CNDDB: 2019-03-26): 6 colonies (unknown number of plants) seen in 1981. Fewer than 10 plants seen in 1984–1986. 404 plants seen in 1990. Approximately 1,000 ramets seen in 1998. 1987 Smith collection also attributed here. 7627 plants in 2006; 8481 in 2007; 11,459 in 2008; 10,806 in 2009; 12,790 in 2010; 9930 in 2011; 12,171 in 2012; 13,579 in 2013; 19,312 in 2014; 22,697 in 2015; 7,960 in 2016. Occurrence includes restoration sites with outplantings. Includes former EO #s 19 & 22.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.
Bold indicates population is extant or presumed extant.

3.4.4.3 Suitable Habitat in the HCP Area

Beach spectaclepod habitat was modeled in the HCP area using known habitat requirements for the species. Modeled habitat includes sand dunes, mainly between the first set of dunes (unstabilized foredunes) and the stabilized dune areas (backdunes) (Map 18). For this HCP, CDPR mapped a total of 870 acres as suitable beach spectaclepod habitat in the HCP area.

3.4.5 Nipomo Mesa Lupine (*Lupinus nipomensis*)

This species is a low-growing, blue-flowered, annual herb in the pea family (Fabaceae). Nipomo Mesa lupine requires fine-grained sandy soils of open sites or sparsely vegetated, stabilized dune communities close to the coast. Flowers are presumably capable of self-pollination but may require insect visitation to maximize seed production. Seed germination and maximum plant size are apparently enhanced by

activities of pocket gophers (Walters and Walters (1988), as cited in USFWS (USFWS 2009b)), which also present a threat of herbivory (USFWS 2000b, USFWS 2009b).

3.4.5.1 Regulatory Status and Threats to the Species

Nipomo Mesa lupine was listed as a state endangered species in 1987 and as a federal endangered species in 2000 (USFWS 2000b). There is no recovery plan or designated critical habitat for this species.

Because Nipomo Mesa lupine exists in a single, small population (section 3.4.5.2) it is vulnerable to extinction from random events (USFWS 2009b). For example, the small population may be vulnerable to catastrophic environmental events such as drought and wildfire and demographic factors such as inbreeding. In addition, coastal development and possible expansion of oil refinery activities (USFWS 2009b) potentially threaten the existing populations of Nipomo Mesa lupine. Expansion of invasive plants, such as perennial veldt grass and iceplant, within the backdune scrub community also threatens this species (USFWS 2000b, 2009b).

3.4.5.2 Regional Distribution and Abundance

Nipomo Mesa lupine is restricted to dry sandy flats of stabilized coastal dunes that lie west of Nipomo Mesa in San Luis Obispo County (USFWS 2009b). Associated species include perennial species as California croton (*Croton californicus*), mock heather, dune eriogonum (*Eriogonum parvifolium*), dune ragwort, and perennial veldt grass (a non-native, invasive species).

At the time of the USFWS 5-year review (USFWS 2019b), only one Nipomo Mesa lupine population, composed of numerous colonies, was known to be extant (Map 23). This population is divided into 3 occurrences, including one extirpated occurrence. The two extant populations are known as occurrence 1 and occurrence 2. Individuals in occurrence 1 are scattered across a 2-mile stretch of backdune habitat west of State Route 1 and between approximately 1 mile south of Black Lake Canyon and Oso Flaco Lake in San Luis Obispo County. The second extant occurrence is located immediately north of occurrence 1 adjacent to Black Lake. USFWS considered all occurrences or colonies in the site to comprise a single population; it is also now recorded as one occurrence in CNDDB (Table 3-19). USFWS estimates the total area of footprint of extant occurrences covers approximately 64 acres (USFWS 2019b). Currently, the species is restricted to nine geographically isolated populations that have a fluctuating total population ranging from 100 to 1,800 individuals in any given year. Much of the habitat for the species is privately owned, mostly by Philips 66, with smaller portions owned by other private landowners. A portion of the habitat also occurs within a California Department of Transportation right-of-way (USFWS 2009b) and in the HCP area within the Phillips 66 leasehold (Map 23).[43] Though potentially suitable habitat extends onto CDPR-owned portions of Oceano Dunes SVRA, no known occurrences exist on CDPR-owned property.

The Cheadle Center for Biodiversity and Ecological Restoration (CCBER) has been working on outplanting experiments for Nipomo Mesa lupine in the Black Lake Ecological Area (protected and managed by the LCSLO) and within the HCP. In late 2012, CCBER partnered with USFWS to study and develop a habitat suitability model for future Nipomo Mesa lupine outplantings. They also began seed bulking in their greenhouse. The LCSLO's Black Lake Ecological Area was selected for outplantings both because of the historical presence of Nipomo Mesa lupine in this location (the species was first described at Black Lake) and the low abundance of perennial veldt grass after more than a decade of control efforts. After a

[43] Road maintenance or other actions conducted by Phillips 66 within the leasehold are not covered activities under this HCP.

disappointing germination in 2015, CCBER reported higher numbers in 2016 and 2017. In the fall of 2022, 10 plot plantings were made with 500 seeds each by Cheadle Center for Biodiversity and Ecological Restoration within the HCP in the West occurrence of the NMLU1 population; outplanting results are currently being monitored.

Table 3-19. Nipomo Mesa Lupine Occurrences In* and Near the HCP Area (Map 23)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
NMLU1*	1	2023	1,749 (total in year)	CNDDB: **Presumed extant**	CNDDB: Population represented by 37 polygons. Entire site details not specified. Population numbers for portions of site: 86 plants in 1980, 272 in 1981, 204 in 1982, 3232 in 1988, 241 in 1998, 3336 in 2004, 2919 in 2005, 780 in 2006 & 2007, 139 in 2008, 531 in 2009, 1195 in 2010, 986 in 2011, 295 in 2012, 1677 in 2013, 252 in 2014, 60+ in 2017. Counts were not conducted in 2018 and 2019. LCSLO: Survey of select plots in Northeast, Southeast, and West regions: 750 in 2020, 125 in 2021, and 358 in 2022 (Roddick and Paolilli 2022). CDPR: 2023 West Region: Total 1,749; 769 in historic population, 980 from 2022 outplanting of 5000 seeds in 10 different plots (Stratton, Lisa, pers. comm. 2022).
NMLU2	10	2023	286	CNDDB: **Presumed extant**	CNDDB: 278 individuals observed in two polygons, reintroduced occurrence. Seeds collected from natural populations on Nipomo Mesa in 2005. CCBER: Outplanting experiments first took place in 2014-2015 producing 118 in 2015, 343 in 2016, 79 in 2017, 89 in 2018, 194 in 2019, 166 in 2020, 21 in 2021 and 21 in 2022. In 2021 and 2022, additional seeds were outplanted producing 286 individuals in 2023 (Stratton, Lisa, pers. comm. 2023).
NMLU3	3	1988	0	CNDDB: Extirpated	CNDDB: Type locality, first collected in 1937. Collected in 1940 and 1941. No plants found on surveys in 1980, 1984, and 1988.
Northeast	N/A	2022	41	N/A	LCSLO: 256 individuals in 2012; 1415 in 2013; 164 in 2014; 342 in 2015; 96 in 2016; 369 in 2017; 41 in 2022 (only subset of site surveyed).
Southeast	N/A	2022	85	N/A	LCSLO: 453 individuals in 2017; 85 in 2022 (only subset of site surveyed).

Table 3-19. Nipomo Mesa Lupine Occurrences In* and Near the HCP Area (Map 23)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
West*	N/A	2023	1,749	N/A	LCSLO: 39 individuals in 2012; 263 in 2013; 88 in 2014; 292 in 2015; 85 in 2016; 89 in 2017. CDPR: 157 on 2020; 48 in 2021; 247 in 2022. In 2023, total 1,749 individuals: 769 within historic population and 980 individuals from seeds outplanted in 2022.
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area. **Bold** indicates population is extant or presumed extant.					

Long-term census data are not reliable enough to assess population trends. However, reliable data from 2006 through 2017 indicate the total numbers of Nipomo Mesa lupine is very low and fluctuates annually (LCSLO 2018). From 2007 to 2017, the LCSLO conducted Nipomo Mesa lupine census surveys annually for the extant population (LCSLO 2018). In 2017, a total of 911 *L. nipomensis* individuals were recorded. Of the plants located, 465 of the 911 individuals achieved seed set, resulting in a 51 percent effective population for the 2016–2017 season. This is down from 2013, where 1,677 individuals were recorded with 759 of the 1,677 setting seed, resulting in a 45 percent effective population (LCSLO 2018). From 2018 to 2022, the LCSLO conducted a 4-year plot monitoring study throughout a subset of the population within the west, southeast and northeast areas of NMU1; Table 3-20 in Roddick and Paolilli (2022). From 2020 through 2022, CDPR surveyed all areas within the HCP that were not covered under the LCSLO plot surveys and collaborated with LCSLO to compile a complete census of the portion or the population within the HCP. In 2023, CDPR began annual census surveys of the entire Nipomo Mesa population within the HCP without participation from the LCSLO.

In 1999, CDFW met with CDPR and the LCSLO to outline a program of European beach grass and perennial veldt grass removal on private land within the Guadalupe Dunes. Since 2000, the LCSLO has removed perennial veldt grass from Nipomo Mesa lupine habitat. While this work has slowed the conversion of this habitat to a monoculture of perennial veldt grass, this management likely will have to continue in perpetuity to maintain open patches required by Nipomo Mesa lupine (USFWS 2009b). Beginning with the 2015–2016 season, OHMVR Division took over invasive species management activities in the HCP area within the Phillips 66 leasehold area (LCSLO 2017).

In 2016, CDPR obtained CESA Scientific, Educational, or Management Permit (No. 2081a-16-004-RP) Invasive Species Control for Nipomo Mesa Lupine Recovery, in 2021 obtained an updated permit, and in 2022 obtained an amendment to the permit, currently No. 2081(a)-21-008-RP Amendment 1 (see section 2.2.2.1.5). Under the existing permit, current annual activities include herbicide application with graminicides with covered species buffer restrictions, manual removal of perennial veldt grass with seasonal restrictions and caging of plants to protect against herbivory. In 2022, CDPR began caging Nipomo lupine plants, with all individuals in the HCP caged in 2022 and 55% of individuals in the HCP caged in 2023. The population has responded favorably to management activities with increases in population within the HCP from 48 individuals in 2021 to 247 individuals in 2022. And in 2023, there were 769 individuals within the historic population, the highest count since LCSLO census surveys began in 2007. Within the CCBER seeding plots an additional 980 individuals germinated in 2023, resulting in a total of 1,749 individuals within the HCP. Of the 1,749 individuals, 53% set seed.

3.4.5.3 Suitable Habitat in the HCP Area

Nipomo Mesa lupine habitat was modeled in the HCP area using known habitat requirements for the species, including stabilized dunes (sandy soil). For this HCP, CDPR mapped a total of 117 acres as suitable Nipomo Mesa lupine habitat in the HCP area.

3.4.6 Gambel's Watercress (*Nasturtium gambelii*)

Gambel's watercress is a rhizomatous, perennial herb in the mustard family (Brassicaceae) that can grow up to 6 feet tall. This species characteristically roots from the stem, which bears scattered compound leaves and dense clusters of white flowers. Gambel's watercress is found in freshwater or brackish marsh habitats at the margins of lakes and along slow-flowing streams. It grows in or just above the water level and requires a permanent source of water. In San Luis Obispo and Santa Barbara counties, Gambel's watercress has been reported to grow in perennially swampy and other mesic areas with bulrush (*Scirpus* spp.), broad fruit bur-reed, cutleaf water-parsnip (*Berula erecta*), straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*), western poison oak, willow (*Salix* spp.), and other riparian vegetation (USFWS 2016c). Gambel's watercress generally blooms from April to July.

3.4.6.1 Regulatory Status, Recovery Plan, and Threats to the Species

Gambel's watercress was listed as a state threatened species in 1990 and as endangered by the USFWS in 1993 (USFWS 1993). Gambel's watercress is one of two species addressed in the Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Nasturtium* [*Rorippa*] *gambelii*) (USFWS 1998); amended 2019 (USFWS 2019c). Recovery objectives for these species include the following:

- Protect, maintain, and enhance habitats
- Monitor and document species populations and habitat characteristics
- Conduct research on the ecology and biology of the species
- Expand existing populations
- Establish new populations
- Evaluate progress and update management and recovery guidelines

The following conditions are serious threats to any remaining Gambel's watercress populations: (1) hybridization and subsequent genetic introgression with the closely related *N. officinale*; (2) habitat loss and degradation; (3) adverse effects from eutrophication (artificial or natural addition of substances such as nitrates and phosphates to an aquatic system); (4) sedimentation; (5) encroachment of non-native eucalyptus trees; and (6) drilling of water wells in the immediate watershed (USFWS 2009f, 2011c, CNDDB 2024). In 2013, the Regional Water Quality Control Board amended the Central Coastal Basin plan by adopting total maximum daily loads (TMDLs) for nutrients and orthophosphates in the Lower Santa Maria River watershed, including Oso Flaco Lake and tributaries; the State Water Resources Control Board adopted the amendment in 2014 (State Water Resources Control Board 2014). Achieving the TMDLs should help alleviate adverse effects on native species from nitrogen and other biostimulatory chemicals that are found in the watershed (Regional Water Quality Control Board, C. C. R. 2013).

3.4.6.2 Regional Distribution and Abundance

Historically, Gambel's watercress occurred in interior wetland areas of Orange, San Bernardino, and Los Angeles counties, as well as coastal wetland areas of San Luis Obispo and Santa Barbara counties. A population from Mexico is thought to be extirpated (USFWS 2009f).

At the time of listing, there were three known extant occurrences of Gambel's watercress: Black Lake Canyon, and, within the HCP area, Oso Flaco Lake and Little Oso Flaco Lake. (Table 3-20; Map 24; (USFWS 1993). The Black Lake Canyon and Little Oso Flaco Lake occurrences are now considered to be "possibly extirpated" (USFWS 2009f, Rorippa gambellii [Nasturtium gambelii] (Gambel's watercress) 5-Year Review: Summary and Evaluation 2011c, CNDDB 2024), with some observers indicating individuals appeared to show introgression with *N. officinale* (white or common watercress (CNDDB 2024). The Gambel's watercress occurrence at Oso Flaco Lake was observed in fall 2013 (Chestnut, J., pers. comm. 2013), and the Oso Flaco area was surveyed again in 2018. Within the Oso Flaco Lake area, surveyors found a very healthy population of Gambel's watercress on the farm drain on the agricultural property. The number of individuals or distribution acreage was not determined. The populations of Gambel's watercress previously observed along the Oso Flaco Lake Causeway were gone (Chestnut, pers. comm. 2019). In 2020, populations previously observed within Oso Flaco Lake were surveyed by CDPR and John Chestnut. Only one individual was observed, located on the northern bank west of the service road, with the majority of the plant submerged and only one stem above the waterline. This location was revisited in 2022 by CDPR, and 10 stems were observed above the waterline growing within a floating California bulrush stand, but the number of individuals could not be determined due to dense cover.

As of the last 5-Year Review there are currently two confirmed, extant occurrences, including Oso Flaco Lake and a stream tributary to San Antonio Creek on VSFB in Santa Barbara County (USFWS 2022b). Genetics studies in 2000, 2008, 2012 and 2020 were conducted to evaluate the genetic integrity of the extant Gambel's watercress population (USFWS 2022b). The studies conducted in 2012 and 2020 found no evidence of hybridization between Gambel's and common watercress at VSFB but showed strong genetic evidence of hybridization with common watercress within all samples collected from Oso Flaco Lake (USFWS 2022b).

The occurrence in Black Lake Canyon in San Luis Obispo County has not been seen since 1994 (CNDDB 2024), and the occurrence north of Black Lake Canyon is also considered extirpated. Pure Gambel's watercress is known from two wild populations that were discovered in 1998 and 2016 (Rutherford, C., pers. comm. 2016) on VSFB in Santa Barbara County and from one population that was introduced in 2008 within the Guadalupe-Nipomo Dunes National Wildlife Refuge, where a combination of 600 marsh sandwort and Gambel's watercress plants were planted at eight sites. However, the plants have not fully established at the Refuge, and the USFWS does not consider it to be a viable population (USFWS 2011c). An unknown watercress species (*Nasturtium* sp.) was observed in the HCP area near Oso Flaco Creek during vegetation mapping surveys conducted in 2012 (MIG 2015). This HCP shall treat any watercress found within the HCP area as Gambel's watercress barring contrary identification by a qualified biologist/Natural Resource staff.

3.4.6.3 Suitable Habitat in the HCP Area

Suitable habitat for Gambel's watercress was modeled for the HCP area using known habitat requirements for the species. Known habitat is defined as all perennial wetlands, including freshwater marshes (fens), slow moving creeks in open places in peat, possibly in brackish waters (USFWS 1998). For this HCP, CDPR mapped a total of 11 acres as suitable Gambel's watercress habitat in the HCP area.

Table 3-20. Gambel's Watercress Occurrences In* and Near the HCP Area (Map 24)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
GAWC1*	1	2022	Unknown<10	CNDDB: **Presumed extant**	CNDDB: Several colonies reported and mapped since 1984. W of road, N. shore: 100 in 1984; 300 in 1989; 0 in 1992 & 1998. W of road, S shore: 10 in 1998; 68 in 1998. E of road, NE shore: <5 in 1988; 0 in 1989; >150 in 1998. E of road, S Shore: >400 in 1998. Seen in 1999, 2001, 2005, 2010, & 2014. CDPR: Hundreds seen in 1980s and 1990s. In 2013, Gambel's watercress covered an area measuring 15m x 20m. Very healthy population observed in 2018 (J. Chestnut, pers. comm., 2019). Within the HCP area, W of road, N shore, in 2020, 1 individual observed; in 2022, 10 stems observed within floating bulrush stand, number of individuals could not be determined due to dense cover. Locations of past observations E of road and NE shore and E of road S shore surveyed in 2020 and 0 individuals observed. Outside of HCP area, E of road, S shore (private property), visited 2020 and 2022 with permission from owner, healthy population observed both years, throughout drainage channel that leads to Oso Flaco Lake, plants were not counted.
GAWC2*	9	2020	0	CNDDB: Possibly extirpated	CNDDB: East colony: approximately 300 in 1989 forming pure stand in ditch; approximately 500 in 1993 and 1994; 0 in 1998. West colony: <10 in 1985, 0 in 1989 and 2005. Not surveyed in 2013. Specimens from the site appear to be either *N. gambelii x officinale* or *N. officinale*. CDPR: In 2020, location of west colony, S shore, and N shore within HCP area surveyed; 0 individuals observed.
GAWC3	10	2005	0	CNDDB: Possibly extirpated	CNDDB: approximately 100 plants seen in 1988; approximately 1,000 in 1992; 50 flowering plants in 1993. Not seen in 2005.
GAWC4	11	2005	0	CNDDB: Possibly extirpated	CNDDB: approximately 500 plants in 1994. No plants seen in 1998, 1999, or 2005.

Table 3-20. Gambel's Watercress Occurrences In* and Near the HCP Area (Map 24)					
GAWC5	2	1981	0	CNDDB: Extirpated	CNDDB: General site based on a 1947 Hoover collection from "Near small twin lake" and 1981 Wise collection from "Celery Lake." Extirpated by development or alteration of habitat.
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area. **Bold** indicates population is extant or presumed extant.					

.

Chapter 4. Potential Biological Effects/Take Assessment

4.1 Overview

Chapter 4 describes the potential direct and indirect effects of the covered activities on each the covered species and their habitats. Chapter 4 then describes the potential for incidental take of covered animal species during implementation of covered activities. Effects on critical habitat, anticipated impacts of the take on each species as a whole, and cumulative impacts are also discussed. CDPR is committed to its policy of avoidance and minimization of take of listed species. Thus, Oceano Dunes District implements an ongoing comprehensive natural resources management program, including management of the covered species. This management program forms the basis for this HCP's conservation program and AMMs (Chapter 5). The ongoing natural resources management program, including covered species management, is an activity covered by this HCP. The take assessment for all covered animal species includes implementation of the conservation and AMMs described in detail in Chapter 5. Together, the chapters in this HCP provide a complete analysis of covered animal species' incidental take in the HCP area.

The effects analyses in this chapter discuss all aspects of covered activities that could possibly affect the covered species. However, not every effect on a covered species rises to the level of take. FESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S. Code §1533(19)). "Harm" is further defined as "an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." "Harass" is further defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR §17.3). Pursuant to the Principal Deputy Director's Memorandum (USFWS 2018a), harassment is not a form of take permitted under section 10(a)(1)(B) since it is not incidental take and is instead an intentional or negligent act.

The California Fish and Game Code prohibits take or possession at any time of fully protected species designated under sections 3511, 4700, 5050, and 5515, with few exceptions (section 1.5.4). The CLTE is a California fully protected species. California Fish and Game Code section 2835 authorizes CDFW to permit the take of any covered species, including species designated as fully protected species, whose conservation and management are provided for in an approved NCCP. CDPR is currently in the preliminary stages of preparing an NCCP to cover CLTE and the six state-listed plants also included in this HCP. The NCCP program takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. An NCCP identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity—in this case, motorized and non-motorized recreation.

Each species' effects analysis is followed by the take assessment for that species. While take of listed plants is not prohibited under FESA, CDPR has included them in this HCP and requests assurances for them under USFWS's "No Surprise" assurances rule, discussed in section 6.5.2. Take levels are expressed in this HCP in the following ways: (1) in terms of the specific number of animals if those numbers can be estimated and (2) in terms of habitat acres to be affected generally or because of a specific activity, in cases where the specific number of individuals is unknown or indeterminable. Take estimates are based on the best available estimate of take that may occur and, in many cases, take estimates are largely based on the size of the population in the HCP area and/or past observations of take. In cases where take is difficult to estimate due to the variable size of the population in the HCP area, difficulty in

estimating the population size, difficulty in finding a dead or injured individual due to such things as small body size, and/or difficulty in determining the extent of the disturbance impact, take is also quantified as the number of acres of habitat that are affected by the covered activities, if appropriate.

The analysis of the impacts of the take includes a summary of the status and distribution of the species within its range, a summary of the loss and conservation of the species expected to occur with implementation of the HCP, and a conclusion regarding the overall impacts of the take associated with the HCP on the species as a whole.

This HCP supports a request to authorize take that arises incidental to otherwise lawful activities (e.g., recreation, visitor services, park operations, and some natural resource management activities), which is permitted via a FESA section 10(a)(1)(B) ITP. Impacts to covered species from measures taken to enhance the propagation or survival of a listed species (e.g., monitoring or habitat restoration), which are authorized via a FESA section 10(a)(1)(A) Recovery Permit, will not be specifically included in the ITP. Rather, those impacts to covered species will be authorized by a Recovery Permit (TE-815214-10). This HCP describes the effects of these recovery activities to provide a comprehensive understanding of the conservation program. Thus, all covered species management activities are analyzed even if some of the potential impacts (see Appendix C) will be authorized by a Recovery Permit.

4.2 Methods Used to Analyze Effects on Covered Species

This chapter provides both a qualitative and quantitative analysis of the effects on covered species resulting from implementing covered activities. Covered activities may directly or indirectly affect covered species. Direct effects on covered species occur at the time and location the covered activity is undertaken. Examples of direct effects would include crushing a SNPL egg or removing CRLF habitat when clearing vegetation from waterways. Direct effects can be either permanent or temporary. Indirect effects are defined by USFWS as “those that are caused by the proposed action and are later in time, but are still reasonably certain to occur” (50 CFR §402.02). Examples of indirect effects would include constructing a new trail that facilitates predator access into SNPL and/or CLTE nesting habitat causing increased predation or predators following human tracks into the SNPL and/or CLTE nesting habitat and preying on eggs at the nest.

The land area and covered species affected by many of the covered activities overlap, and the nature of the effects among activities can also be similar. To provide a comprehensive assessment, however, the potential effects of each covered activity are discussed separately.

The following summarizes the general methods used to evaluate effects on covered species. Details on methods used for specific species are described below in the respective section for each species.

Quantitative methods with respect to modeled suitable habitat for covered species include the following:

- Define and map modeled suitable habitat for each of the covered species.
- Intersect modeled suitable habitat with covered activities having permanent impacts to quantify acreage of affected modeled suitable habitat within these areas.

Quantitative methods with respect to covered species occurrences include the following:

- Document known occurrences of the particular covered species within the HCP area.
- Intersect the known occurrences with covered activities with permanent impacts.

- Estimate potential additional occurrences, as appropriate, within modeled suitable habitat based on results of previous surveys and on available life history information in the species accounts for the particular species (e.g., territory size, home range, and typical population densities and spatial distribution patterns).
- Estimate potential impacts to individuals of each species, to the extent feasible, and modeled suitable habitat.
- Estimate the reduction of impacts to covered species individuals as a result of applying avoidance and minimization measures, as appropriate.

Qualitative methods with respect to modeled suitable habitat and species occurrences include assessing potential effects due to non-permanent covered activities based on descriptions of covered activities in Chapter 2 and known and likely threats to each species as identified in the species accounts in Chapter 3.

4.3 Western Snowy Plover

The following sections describe effects on SNPL and potential SNPL habitat in the HCP area. Section 4.3.2 summarizes the potential effects and potential take of SNPL from covered activities, and Table 5-2 provides AMMs that address the effects. Activities occurring in tertiary habitat for SNPL are not anticipated to affect the species unless specifically discussed in the following sections. Note that to provide a comprehensive understanding of the conservation program, this HCP describes impacts that will not be included in the ITP but rather directly authorized under the Recovery Permit (TE-815214-10).

4.3.1 Direct and Indirect Effects of Covered Activities on Western Snowy Plover

Even though avoidance and minimization of take will continue to be the primary objective of the program, effects of covered activities on SNPL may occur during both the breeding and non-breeding seasons. The OHMVR Division dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season.[44] Thus, many of the effects that could occur during the breeding season are minimized.

Covered activities occur within all 4,513 acres of SNPL habitat, including critical habitat. This includes 698 acres of primary habitat, 250 acres of secondary habitat, and 3,565 acres of tertiary habitat (section 3.3.1.7). Map 25 shows the location of covered activities in relation to SNPL habitat. Effects on critical habitat are discussed in more detail in section 4.11.1. As described in section 3.3.1.7, SNPL nests are typically found within the Exclosures. However, some nests are found outside the Exclosures such as the 48-acre foredune area, open riding area, or vegetation islands, and suitable breeding habitat for SNPL is present outside of the non-vehicle use area. As a result, this HCP describes potentially suitable SNPL habitat by using the categories primary, secondary, and tertiary. A summary of each habitat category follows:

- Primary habitat includes areas that support breeding, foraging, and roosting. Primary habitat in the HCP area includes the shoreline, beach, and sparsely vegetated foredune habitat that is generally within 492 to 1,640 feet of the shore extending from Arroyo Grande Creek south to

[44] Management is also implemented outside of the breeding season for wintering SNPL; however, fewer staff and resources are available during the non-breeding season and fewer AMMs are implemented (e.g., monitoring is not conducted as frequently and seasonal exclosures are not in place).

the Oceano Dunes southern boundary (Map 10). Primary habitat also includes most of the Exclosures and 48-acre foredune area. Between 2005 and 2023, 3,470 of 3,546 SNPL nests were discovered in primary habitat (Table 3-2, Map 11).

- Secondary habitat supports breeding, foraging, and roosting, but the habitat has been degraded by historic land use or the physical habitat features are lower quality than primary habitat for breeding, foraging, and roosting. Secondary habitat in the HCP area includes Pismo Beach from Arroyo Grande Creek to Addie Street, as well as habitat inland (i.e., east) from primary habitat, ranging from 984 to 1,969 feet of the mean high tide line and the south- and east-facing slopes of the leeward side of the foredune in the open riding area and Oso Flaco area (Map 10). SNPL occasionally attempt to nest in secondary habitat, but to a much lesser extent than in primary habitat. Between 2005 and 2023, 62 of 3,546 SNPL nests were discovered in secondary habitat (Table 3-2, Map 11).
- Tertiary habitat provides very little of the physical and biological features needed to support breeding, foraging, and roosting, and SNPL rarely use this habitat. Tertiary habitat in the HCP area includes Pismo Beach north of Addie Street, including the Pismo Pier, as well as all other potentially suitable habitat in the HCP area not identified as primary and secondary habitat (Map 10). Between 2005 and 2023, only 14 of 3,546 SNPL nests were observed in tertiary habitat (Map 11).

Covered activities have different intensities of effects depending on the type of habitat (i.e., primary, secondary, and tertiary) affected and the type of activity (e.g., motorized, non-motorized, management-related) occurring in the habitat. For example, effects on SNPL in tertiary habitat are relatively low (if any) because SNPL rarely nest in tertiary habitat or otherwise use this habitat for foraging and roosting (section 3.3.1.7).

Motorized and non-motorized recreation are the predominant covered activities affecting SNPL and their habitat, with motorized recreation having the greatest effects on SNPL in the HCP area (section 4.3.1.1.1). Motorized recreation occurs in 1,210 acres of SNPL habitat (i.e., approximately 423 acres in primary, 160 acres in secondary, and 627 acres in tertiary habitat). Non-motorized recreation also has an effect on SNPL, especially within suitable habitat that is not open to motorized recreation. Non-motorized recreation occurs within approximately 2,622 acres of SNPL habitat where motorized recreation is not permitted (i.e., approximately 274 acres within primary, 90 acres within secondary, and 2,257 acres within tertiary habitat). Non-motorized recreation also occurs within the entire area open to motorized recreation. The effects of non-motorized recreation on SNPL depend on the intensity of use (e.g., numbers of park visitors to a given area), type of activity (e.g., dog walking, horseback riding, picnicking), and the type of habitat (i.e., primary, secondary, tertiary) affected.

The following sections describe the mechanisms by which covered activities could affect SNPL. Effects will be avoided and minimized, to the extent feasible, through existing and new AMMs. Therefore, not all effects are expected to rise to the level of take, as defined by FESA. AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Table 5-2. Despite the implementation of AMMs, some take of SNPL adults, juveniles, chicks, and eggs will still occur due to covered activities. Expected take levels are described in greater detail in section 4.3.2.

4.3.1.1 Park Visitor Activities

4.3.1.1.1 Motorized Recreation (CA-1)

Vehicle Strike – Breeding Season. Vehicles driving within tertiary habitat do not currently impact breeding, foraging, and roosting SNPL and are not expected to impact breeding, foraging, or roosting SNPL in the future. Therefore, activities in these areas will not affect SNPL.

A large portion of the SNPL breeding population in the HCP area nests within the Southern Exclosure, which is within the southern portion of the open riding area that is fenced and closed to the public during the breeding season, including the shoreline (March 1–September 30). SNPL adults, eggs, and chicks within the exclosure are protected from motorized recreation activities. Therefore, SNPL within these areas will not be directly impacted by motorized recreation.

SNPL will sometimes nest outside the protection of the Exclosures (Southern Exclosure and North Oso Flaco Exclosure) in areas open to vehicles. SNPL have been known to nest outside the Exclosures in the open riding area and near Arroyo Grande Creek in areas close to the shoreline open to street-legal vehicles. SNPL also nest in the 48-acre foredune area. The cryptic nature of SNPL nests and chicks makes it conceivable that a vehicle could crush an active SNPL nest or a chick that is outside the fenced area and not yet identified by monitors. Vehicle traffic has been known to result in the destruction of shorebird eggs, chicks, and adults (Warriner, et al. 1986, Melvin, Hecht and Griffin 1994). Any incubating or brooding adults at the nest will also be vulnerable to vehicle strike; however, adults typically respond to disturbance by flushing from the nest and/or brood (Flemming, et al. 1988) rather than sitting on the nest where they would be more vulnerable to vehicle strike. SNPL may also avoid nesting in areas open to vehicles due at least in part to frequent disturbance when nesting, which may make them less vulnerable to impacts associated with motorized vehicles. As noted above, most SNPL in the HCP area nest within the Exclosures, thus protecting eggs and chicks from vehicle strike.

CDPR also implements an ongoing SNPL and CLTE management program in the HCP area to further protect SNPL nests from vehicle strike. As part of this program, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found in the riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure will be installed as soon as possible, as appropriate, thus reducing the likelihood of a vehicle striking a SNPL or crushing a nest. The 48-acre foredune area is closed to the public when nests and broods are present, including the shoreline and western portions of the alleyways between the plots. In addition, the upper Arroyo Grande creek and estuary, where SNPL may nest, are closed to vehicles year-round. Monitors will also continue to track SNPL chicks that are hatched within the riding area (i.e., within single-nest exclosures) to determine travel routes and patterns associated with foraging and exploration and either erect symbolic fencing to provide safe passage of the chicks to a non-vehicle use area or divert vehicle traffic, as appropriate.

Based on the results presented in the SNPL and CLTE Annual Breeding Season Reports (Appendix G), since these AMMs began to be implemented as part of the SNPL and CLTE management program, the AMMs have been successful at protecting SNPL nests (e.g., few chicks and eggs have been found crushed/killed by a vehicle), increasing reproductive success, and reducing direct impacts to nesting SNPL (e.g., few adults have been found injured or killed by vehicles in the breeding season) outside the Southern Exclosure from motorized recreation. As a result, direct impacts to nesting SNPL outside the Southern Exclosure due to motorized recreation will continue to be minimal. Although unlikely, some SNPL eggs, chicks, and adults could still be struck by vehicles if they go undetected.

In the breeding season, SNPL forage, traverse, and roost in the open riding area and along the shoreline south of Grand Avenue and north of Post 2, which is not fenced and is open to street-legal vehicles. Vehicles driving through these areas could strike individual adults, juveniles, or chicks that are walking, roosting, and/or foraging outside the Southern Exclosure. This may be especially true for chicks, since they have been observed responding to approaching vehicles with apparent indifference and only jumping from the path of a vehicle's front tire when the vehicle was 3.28 feet away (Flemming, et al. 1988). In addition, SNPL are likely more vulnerable to vehicle strike by speeding vehicles since there is less time for the bird to move out of harm's way, and the driver may not see a bird. Mad River Biologists (2005) found that shorebirds using Oceano Dunes SVRA, especially SNPL and sanderlings, were highly

tolerant of vehicle disturbance when vehicles were traveling at the legal shoreline speed limit of 15 mph or less and were passing very nearby, but were not on a collision course with them. The birds often did not react even at close distances (e.g., approximately 10 feet). In contrast, shorebirds, including SNPL, always reacted to a vehicle that was on a collision course with them. Shorebirds at Oceano Dunes SVRA may be acclimated to vehicle activity and thus less subject to disturbance. This acclimatization, however, may leave them more vulnerable to strike should a driver engage in sudden, unexpected changes in direction (Mad River Biologists 2005). Adults and chicks may also roost and move about in tire tracks. If chicks are unable to climb out of tire tracks, they become more vulnerable to vehicular traffic impacts since most people use the same tracks when returning (Melvin, Hecht and Griffin 1994).

In order to reduce the risk of vehicles striking a foraging or roosting SNPL in areas open to vehicles, CDPR will continue to implement the SNPL and CLTE management program. As part of this management program, speed limits are enforced (i.e., speed limits are posted on the shoreline and rangers issue citations) in the HCP area. CDPR will also continue to conduct daily monitoring for SNPL during the breeding season to enable better identification of potential threats. In addition, if broods are observed to be in harm's way, vehicle traffic flow is diverted or regulated to allow the safe movement of the brood.

CDPR will also implement the new AMM 22, which establishes a maximum number of eggs and chicks that can be captured (e.g., up to 12 eggs/4 nests and 12 chicks/4 broods), as necessary, to protect them from covered activities not related to covered species management. The measure also establishes a threshold (i.e., 8 eggs and 8 chicks) at which point CDPR would contact the USFWS and discuss whether AMMs (e.g., expanding the exclosure along the shoreline to provide additional protected foraging habitat, increasing monitoring along the shoreline, increasing signage in the breeding area) are appropriate to reduce impacts of additional take that could occur from covered activities not related to covered species management activities. With these measures, mortality impacts will be minimized and although unlikely, some vehicle strike could still occur. Some capture of SNPL chicks will likely occur.

Vehicle Strike at Night – Breeding and Non-breeding Season. Registered campers can drive in the street-legal access corridor and open riding area 24 hours a day, and day use is allowed until 10 pm. Some biologists have raised concern that nighttime vehicle traffic may be especially hazardous for SNPL since SNPL roost and forage near the shoreline at night (Pienkowski 1983) (Staine and Burger 1994) (Mad River Biologists 2005). Drivers of ATVs at night have run over SNPL at VSFB, and a ranger patrol vehicle crushed SNPL chicks at Oceano Dunes SVRA during a night patrol (USFWS 2007a). However, during the breeding season in the HCP area the Southern Exclosure protects most foraging chicks and adults from vehicle strike. In addition, Mad River Biologists (2005) found that SNPL reacted more quickly, and at a greater distance, to an approaching vehicle at night than during the day. They were also more likely to respond by flying rather than running when disturbed at night (Mad River Biologists 2005). Consequently, in assessing the risk of collision between birds and vehicles at night, the higher degree of reaction (i.e., more likely to react, more likely to fly than run, and reacting to vehicles at greater distance) likely decreases the risk of collision with vehicles at night. Although unlikely, it is still possible that a SNPL roosting or foraging at night could be struck by a vehicle, especially during the non-breeding season.

Vehicle Strike – Non-breeding Season. SNPL are present and vulnerable to vehicle strike or disturbance during the non-breeding season. As noted in section 3.3.1.4.2, wintering SNPL are found foraging and roosting in various areas of the riding area, and flock locations may change often during each day. In the past, flocks were frequently concentrated north of Post 2 or between Grand and Pier avenues, where OHV use is prohibited but street-legal vehicles are allowed. More recently, flocks have been observed in the open riding area south of Post 2, where OHV use is allowed. During the 2022-2023 winter, the

largest flocks were mainly found between Post 4 and Post 6 on average, with the largest flock of 246 individuals seen between Post 2 and Post 4.

To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes weekly monitoring for wintering SNPL in the HCP area to locate foraging and/or roosting birds, enforcement of the posted speed limits, placing additional speed limit signs or protected wildlife signs near foraging and/or roosting flocks, and implementing public education methods (e.g., handing out brochures, posting signs, social media posts). Implementation of the SNPL and CLTE management program reduces the impacts to wintering SNPL from motorized recreation; however, some vehicle strike of wintering SNPL has still been documented, including in recent years. Wintering SNPL may be most at risk to vehicle strike during storm events and high tides/large surf (CDPR 2017c). Neuman et al. (2005) also found that at high tide, the mean numbers of shorebirds overall (and SNPL specifically) per mile in the open riding area were negatively related to disturbance levels.[45] As a result, if determined to be necessary to reduce the risk of vehicle strike and disturbance during the non-breeding season, Natural Resource staff will recommend to the District Superintendent that the beach be closed to motor vehicle recreation activities temporarily until such conditions (i.e., storm events, high tides, large surf) no longer exist. If determined to be necessary by the District Superintendent, CDPR staff will temporarily close the Grand Avenue park entrance to vehicle traffic during certain high tides and storm events in order to eliminate conflict between foraging/roosting wintering SNPL and vehicles. During the closures, beach conditions will be regularly monitored and vehicle recreation will only be allowed again after CDPR staff have determined that no harm would occur to roosting SNPL. With the implementation of these measures, impacts to wintering SNPL from vehicle traffic are anticipated to be reduced. However, some wintering SNPL could still be struck by vehicles.

Nesting or Brooding Disturbance. SNPL nesting near the Southern Exclosure fenceline or in the open riding area can be disturbed by nearby motorized recreation. Chronic disturbance of breeding adults from motorized activities can directly or indirectly affect chicks or eggs. Chicks or nests can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, chicks can be orphaned or inadequately nourished, and eggs could be buried by sand or not properly incubated (Warriner, et al. 1986). Disturbance by vehicles has been shown to increase both egg and chick mortality in SNPL (Warriner, et al. 1986) (Flemming, et al. 1988) (Staine and Burger 1994) . Chicks repeatedly disturbed by vehicles may die of exhaustion (Powell 1996) or be separated from adults (Warriner, et al. 1986). These effects are exacerbated if human disturbance coincides with periods of high wind or extreme temperature. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Specifically, CDPR will continue to conduct daily monitoring to enable better identification of potential threats. If broods are observed to be in harm's way, vehicle traffic flow will be diverted or regulated to allow the safe movement of the brood. In addition, a nest avoidance buffer a minimum of 100 feet will be used to protect SNPL nests in the open riding area. The buffer will be increased, as necessary, until monitors observe that SNPL adults and chicks are no longer disturbed. As a result, disturbance to nesting or brooding SNPL associated with motorized recreation will continue to be minimized. Although these measures will reduce impacts to SNPL eggs and chicks in the riding area, some eggs and chicks may need to be captured and brought to a captive rearing facility to prevent mortality and injury (AMM 22).

Foraging and/or Roosting Disturbance – Non-breeding Season. Where it is allowed, motorized recreation can disturb roosting or foraging adult SNPL during the non-breeding season, especially in

[45] This pattern was not apparent at low tide (Neuman, Page and George 2005).

areas where the shoreline is narrow (e.g., between Grand and Pier avenues, west of the 48-acre foredune area). Disturbance from vehicles can cause SNPL to continually flush or move from the area, which can result in increased vigilance or stress and/or decreased foraging/resting. However, adult SNPL can move from the disturbed area to other available foraging/roosting habitat; therefore, although this impact can occur it is considered to be minimal.

Increased Predators. Recreationists increase the presence of trash, most of which is disposed of properly in dumpsters. However, any trash that is accessible to predatory species may artificially increase the number of individual predators in areas being used by SNPL and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring all visitors to deposit their trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches and seasonally remove trash by mechanical means. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. As a result, this effect is reduced. However, generalist predators that forage on refuse continue to be present in the HCP area (i.e., coyotes, gulls, crows, and ravens) and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

Reduced Habitat. Motorized vehicle recreation may reduce available habitat for SNPL and other shorebirds by limiting use in the open riding area compared to non-motorized areas, especially in certain conditions such as during high tides. (Neuman, Page and George 2005) conducted studies comparing shorebird abundance, behavior, and disturbance in the open riding area with that along the shoreline to the south, which is open only to non-motorized recreation. Disturbance levels were found to be greater in the open riding area and mean daily densities of all shorebird species combined (and of SNPL alone) were greater in non-vehicular areas. Therefore, it appears, at least to some degree, SNPL (and other shorebirds) avoid areas open to vehicle recreation. To reduce impacts related to reduced habitat, CDPR will continue to implement the SNPL and CLTE management program. As part of this program, CDPR installs fencing to close the Southern Exclosure (i.e., predator fence for the seasonal exclosure and additional symbolic fence for the shoreline) that prohibits vehicle and human trespass and ensures suitable nesting and brood-rearing habitat is maintained within the HCP area. Since implementation of the SNPL and CLTE management program, including the installation of the Southern Exclosure, SNPL and CLTE reproductive success has improved in the HCP area, and most SNPL have nested within the protected areas. This trend is expected to continue in the future. As a result, this impact is considered minimal.

Motorized recreation in the non-breeding season can alter dune vegetation and topography necessary for breeding. Specifically, motorized recreation can reduce vegetation, organic surface materials (e.g., driftwood and wrack), and microtopography (e.g., hummocks) required for SNPL breeding, foraging, and/or roosting (Maclvor, Melvin and Griffin 1990, Powell 1996). Altering these habitat features can increase SNPL exposure to predators or inclement weather and reduce prey availability for foraging SNPL during the breeding season. Although some wrack naturally develops within the Southern Exclosure during the breeding season, it is not quickly colonized by invertebrates and thus does not provide the diversity or abundance of this important SNPL food source (CDPR 2009b) found in areas not subject to motorized recreations. The ongoing SNPL/CLTE management program mitigates these effects by placing natural materials such as driftwood and wrack in the Southern Exclosure and inoculating wrack with talitrids (commonly called beach hoppers) to ensure prey species for SNPL and cover from predators are available in the protected areas. The Southern Exclosure currently has some large areas of dense vegetation with hummocks, but if necessary (i.e. large barren areas develop over time as a result of motorized recreation), the program also includes seeding and planting foredune species to ensure the

Southern Exclosure continues to provide some cover from predators and inclement weather. As a result, effects on SNPL of altering habitat from motorized recreation during the non-breeding season is considered to be minimal.

4.3.1.1.2 Camping (CA-2)

The designated campgrounds (i.e., North Beach Campground and Oceano Campground) in the HCP area are not located within suitable SNPL breeding, foraging, or roosting habitat. Therefore, activities in designated campground areas do not affect SNPL.

Vehicle Strike. Camping vehicles driving through tertiary habitat do not affect SNPL. Camping vehicles driving within primary and/or secondary SNPL breeding, foraging, and/or roosting habitat can cause the same type of effects on SNPL in the same overall area as those described for motorized recreation (section 4.3.1.1.1). Therefore, the discussion of motorized recreation effects applies to camping vehicles as well.

Nesting or Brooding Disturbance. Camping activities outside the designated campgrounds within tertiary habitat in the open riding area south of Post 2 do not affect SNPL.

Beach fires and other prolonged activities associated with camping outside the designated campgrounds within primary and/or secondary habitat for SNPL in the open riding area south of Post 2 can disturb any nearby nesting and/or foraging SNPL, causing the nests and/or chicks to be left unattended for long periods and exposed to predators and extreme temperatures. However, camping outside the designated campground areas within primary and secondary habitat typically occurs in areas where SNPL do not nest (e.g., outside the Exclosures). To further minimize impacts of camping activities outside designated campground areas, CDPR will continue to implement the SNPL and CLTE management program. Specifically, any nests found in the open riding area will be protected with single-nest exclosure with a minimum 100-foot buffer, if appropriate. In addition, camping and parking are not allowed within 100 feet of a single-nest exclosure, the Southern Exclosure, or other closed nesting area, to ensure that camping activities do not encroach on or disturb nesting SNPL. Nests in fenced areas but within 100 feet of the open riding area will receive a bumpout. The buffer will continue to be increased, as necessary, until monitors observe that SNPL adults are no longer disturbed. In addition, CDPR staff will continue to hand out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing SNPL nests and chicks.

If driftwood or other naturally occurring materials are collected from the shoreline for campfires, chicks and adults can be disrupted from foraging. However, during the breeding season many SNPL, including chicks, forage along the shoreline of the Exclosures, which is closed to the public. In addition, the 48-acre foredune area and shoreline is closed to the public when nests or broods are present. Therefore, any effects are typically short in duration and minimal in impact in areas where SNPL do forage that are open to pedestrians/campers.

Increased Predators. Campers typically generate more trash than day users, which can artificially increase the number of predators in areas being used by SNPL and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes providing all campers with plastic garbage bags to encourage trash removal from the camp area. CDPR staff will continue to pick up trash in the HCP area on a regular basis and certain approved areas in the open riding area will be cleaned seasonally by a mechanical trash remover no more than twice a year. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. As a result, this effect will continue to be minimized. However, generalist predators that forage on refuse continue

to be present in the HCP area and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

Reduced Habitat. Collecting driftwood or other naturally occurring materials can reduce the quality of cover used by chicks and adults as shelter from inclement weather or predators. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes placing woodchips, large woody material, and beach wrack in the Southern Exclosures to serve as natural shelter. The placement of woodchips, large woody material, and beach wrack in the Southern Exclosure has previously been successful in providing natural shelter for SNPL in the exclosure. As a result, this effect will continue to be minimal.

4.3.1.1.3 Pedestrian Activities (CA-3)

Nesting or Brooding Impacts. Most of the breeding SNPL population within the HCP area nests within the Exclosures, which is surrounded with predator fencing and symbolic fence delineates a closed shoreline. SNPL adults, eggs, and chicks within the Exclosures are protected from pedestrian activities because pedestrians are not permitted in these areas; therefore, direct impacts (e.g., eggs being crushed) from pedestrian activities to SNPL adults, eggs, and chicks within these protected areas are not likely.

Breeding SNPL near the fenceline or outside the Exclosures can be disturbed by pedestrian activities. In addition, unlike motorized vehicles, pedestrians can access the shoreline south of the Oso Flaco Lake boardwalk. Although most of the breeding SNPL population in the HCP area nests within the Exclosures, some SNPL will nest outside of the fenced area (Map 11). The cryptic nature of SNPL nests and chicks makes it conceivable that a pedestrian could crush an active SNPL nest or a chick that is outside the fenced area and not yet identified by monitors, although there are no records of this occurring in the HCP area. Chronic disturbance of breeding adults from pedestrian activities near the Exclosures can also indirectly affect chicks or eggs. People can disturb nesting birds if they approach too closely or quickly (Lafferty 2001a). Shorebird adults and chicks can be more sensitive to disturbance (e.g., flush greater distances and more quickly) by pedestrians than vehicles (Flemming, et al. 1988, Cohen, Durkin and Zdravkovic 2014). Muir and Colwell (2010) found that SNPL flush from the nest when observers approached at a mean distance of 262 feet (80 meters); however, this distance is likely variable depending on location and type of disturbance. Frequent flushing of adults can keep attending adults off the nest or away from chicks. Nests can fail, or chicks can die from exposure to excessive hot or cold temperatures. Chicks or nests can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, chicks can be orphaned or inadequately nourished, and eggs can be buried by sand or not properly incubated.

Studies in California have shown that more SNPL chicks are lost on weekends and holidays than on weekdays. This suggests that increased recreational activity is linked to increased chick loss (Ruhlen, Abbott and Page 2003). To reduce impacts from pedestrians on nesting or brooding SNPL, CDPR will continue to implement the SNPL and CLTE management program. Monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures such as the open riding area and Oso Flaco. Monitoring will continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. Any nests that are found in the riding area will be protected by a large single-nest exclosure, if appropriate. At South Oso Flaco, most nests are provided a single-nest exclosure (7-foot diameter circular exclosure or mini exclosure) and the symbolic fencing is moved west, as necessary and appropriate, to provide a buffer from the nest while still allowing pedestrians to recreate on the beach. If nests are found in the 48-acre foredune, the area is closed to the public. Finally, additional fencing (i.e. bumpout) will be installed to enlarge the Southern Exclosure or other closed area if necessary, to provide a 100-foot buffer from the

nest, to ensure that pedestrian activities do not disturb nesting SNPL. The bumpout will be increased, as necessary, until monitors observe that SNPL adults are no longer disturbed. As a result, the effects of pedestrian activity on nesting SNPL will continue to be minimal.

Stationary activities, such as picnicking and sunbathing, can displace SNPL for long periods. This effect has been most acute along the shoreline south of the Oso Flaco boardwalk, where monitors have observed visitor presence keeping SNPL off nests. In addition, frequent or prolonged pedestrian activities can keep SNPL from using otherwise suitable habitat. Webber et al. (2013) found that high human disturbance was negatively associated with initial SNPL occupancy and colonization of suitable habitat in Florida. Wilson and Colwell (2010) found that family groups of SNPL tended to avoid areas of high human activity and preferentially settled in protected areas. They also found that chicks that hatched outside the protected area traveled greater distances than those that hatched within these areas, likely due to higher human disturbance. Chicks that travel greater distances are likely more vulnerable to predation and inclement weather, especially during the first few days of life. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, symbolic fencing is adjusted in South Oso Flaco, as necessary and appropriate, to be as far west as is possible from the nest, to provide a buffer from the nest and ensure stationary pedestrian activities do not encroach on SNPL nests. Symbolic fence distance from the nest is variable and depends on tide conditions, beach topography, and the need to provide a pedestrian walking path. In addition, if monitors observe visitor activity too close to a nest in the Oso Flaco area, they will ask visitors to relocate farther away from nests, and the symbolic fencing will continue to be adjusted as needed. As a result, the effects on nesting SNPL will continue to be minimal.

If a SNPL chick should enter an area open to pedestrians, a well-meaning visitor may attempt to "rescue" the chick by picking it up and moving it to another location or bringing it to park staff. This has been documented in the HCP area, including in 2014 when a 1- to 2-day-old SNPL chick was picked up by a park visitor and given to park staff. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes handing out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing SNPL nests and chicks. Based on the results presented in SNPL and CLTE Annual Breeding Season Reports (Appendix G) since the SNPL and CLTE management program was initiated, the program has been successful at preventing this situation, and a visitor picking up a chick is a very rare event. If a live chick were to be turned in, staff may attempt to reunite the chick if it is from a known brood or would transfer the chick to an approved wildlife facility.

Foraging and/or Roosting Disturbance. Pedestrians moving through habitat occupied by SNPL can disturb foraging or roosting SNPL, including during the non-breeding season. In Southern California, where levels of human disturbance are high, management of disturbance from humans led to an increase in SNPL abundance during the non-breeding season and the re-establishment of breeding SNPL after a 30-year absence (Lafferty, Goodman and Sandoval 2006). Human traffic may disturb SNPL foraging (Burger 1994) since SNPL frequently feed on terrestrial insects that typically are found in the wrack line where people prefer to walk. Foraging SNPL adults and chicks interrupted by humans were observed to stop foraging and move away from the wrack until the disturbance passed (Webber, Heath and Fischer 2013).

In a study on piping plovers, chicks were found to forage less and were brooded less when humans were within 525 feet (Flemming, et al. 1988). If SNPL spend too much time avoiding disturbance because of frequent or prolonged pedestrian use, they may not be able to dedicate the amount of time necessary to hunt invertebrates and could become emaciated (Webber, Heath and Fischer 2013). Further, suspended feeding and expenditure of energy during repeated flushing can affect reproduction and survival of adults and chicks (Lafferty 2001a). Overall, the types of effects of pedestrian disturbance on SNPL will be similar to disturbance from vehicles (section 4.3.1.1.1), including indirect effects on chicks

and eggs. However, the intensity and extent of pedestrian disturbance to SNPL is likely less than the disturbance caused by vehicles within the HCP area. (Neuman, Page and George 2005) found mean daily densities of all shorebird species combined (and of SNPL alone) were greater in non-vehicular areas, although other environmental factors may have played a role. To ensure this impact is reduced, CDPR will continue to implement the SNPL and CLTE management program. Monitoring will continue to occur on a daily basis during the breeding season and a weekly basis during the non-breeding season. In addition, monitoring will continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. CDPR staff will also continue to hand out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing foraging and/or roosting SNPL. As a result, the effects on foraging and roosting SNPL will continue to be minimal.

Increased Predators. As with all visitors, pedestrians increase the presence of trash, which can artificially increase the number of predators in areas being used by SNPL and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring visitors to deposit all trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches and seasonally remove trash by mechanical means. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. As a result, this effect will continue to be minimized. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

4.3.1.1.4 Bicycling and Golfing (CA-4)

Golfing activities do not affect SNPL since the golf course is not located within or near SNPL breeding, foraging, or roosting habitat.

Few (if any) studies have been conducted that document the effects of bicycles on shorebird species. McLeod et al. (2013)observed waterbirds to have shorter flight initiation distances to cars compared with bicycles, though the number of observations were too few to draw any conclusions. Bicycle riding likely results in a different response than to motor vehicles because bicyclists are more visible to shorebirds. Bicycles also typically travel at slower speeds than motor vehicles and, thus, could disturb birds for longer periods of time. McLeod et al. (2013) also found that pedestrians (singly or in a group) often evoked longer flight initiation distances in 39 species of waterbirds than bicycle riders. Therefore, the discussion above regarding pedestrian effects (section 4.3.1.1.3) on SNPL is likely relevant to bicycle riding, but the effects may be less intense. In addition, bike riding within habitat occupied by SNPL in the HCP area is infrequent. With implementation of the ongoing SNPL and CLTE management program AMMs discussed for pedestrian activities above (section 4.4.1.1.3), effects from bicycle riding on SNPL have been minimal and will continue to be minimal.

4.3.1.1.5 Fishing (CA-5)

Nesting, Brooding, and Foraging Impacts. The effects on SNPL from fishing is similar to the discussion above regarding pedestrian effects (section 4.3.1.1.3); however, the effects are limited to the ocean shoreline where SNPL are more likely to be foraging rather than nesting. Most SNPL nest within the Exclosures where the shoreline is closed to all public access and where fishing is not allowed; therefore, fishing does not affect nesting SNPL in that area. However, fishing does occur near SNPL nesting and chick-rearing areas in South Oso Flaco. People fishing generally occupy habitat longer than pedestrians who are just passing through. As a result, foraging SNPL may avoid areas near fishing activities and are ultimately at less risk of disturbance. If fishing activities such as surf fishing in Oso Flaco do remain near SNPL nests or foraging birds for extended periods of time, however, they can disrupt incubation,

brooding, and foraging for long periods, thereby increasing the exposure of chicks and eggs to extreme temperatures or predation. CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Monitors will thus continue to conduct regular searches for nests in potential nesting habitat to ensure that any nests outside the Exclosures are quickly protected with symbolic or wire fencing and a large single-nest exclosure, as appropriate. Most nests in South Oso Flaco are provided a single-nest exclosure (smaller circular or mini exclosure) and the symbolic fencing is moved west, as necessary and appropriate, to provide a buffer from the nest while still allowing pedestrians to recreate on the beach. If fishing activity is observed disturbing SNPL, visitors will be asked to relocate farther away from nests and fencing will be adjusted, as needed. As a result, direct impacts to SNPL nests from fishing activities will continue to be minimal.

Increased Predators and Entanglement. Discarded fishing line or hooks can entangle or pierce SNPL adults, juveniles, and chicks. In addition to trash, discarded fishing bait may further attract predators to SNPL habitat and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes encouraging and educating anglers about properly disposing of fishing lines, hooks, and bait in trash receptacles. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. As a result, this effect will continue to be minimal.

4.3.1.1.6 Dog Walking (CA-6)

Nesting and Brooding Impacts. Most of the breeding SNPL population within the HCP area nests within the Exclosures. Dogs are not allowed in the Exclosures. Therefore, SNPL adults, eggs, and chicks within these areas are protected from direct impacts (e.g., eggs being crushed) from dogs. In addition, dogs (other than service dogs) are not allowed in the Oso Flaco area. As a result, impacts to SNPL from dogs in this area are minimized.

Service dogs can enter any area where visitors are allowed, including in the Oso Flaco area. In addition, although most SNPL nest within the Exclosures and South Oso Flaco, SNPL occasionally nest in the open riding area, and such nests can be destroyed by dogs. SNPL breeding near the fenceline or outside the non-vehicle use area can also be disturbed by dog walking activities. The presence of dogs has the potential to affect the behavior, distribution, survivorship, and fecundity of SNPL.

SNPL may be displaced from incubation more frequently and for longer duration when dogs are present (USFWS 2007a). Studies on shorebirds (and SNPL) have shown that leading a dog when approaching a nest causes a greater disruption to incubation than humans alone (Lord, et al. 2001). This could leave the nest exposed for longer periods of time, making the nest vulnerable to predation and inclement weather. A study in Santa Barbara County found that dogs (in addition to horses, humans, crows, and other birds) strongly disturb SNPL (Lafferty 2001b) and, in another study, the difference in SNPL response between leashed and unleashed dogs was insignificant (Lafferty 2001a). Brooding and incubating SNPL respond to dogs with avoidance or active distraction displays, thus exposing chicks or eggs to inadvertent trampling or predation, and these disturbances can lead to the eventual separation of chicks from adults. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Monitors will continue to search daily for SNPL nests outside Exclosures, protecting them with large single-nest exclosures, as appropriate. Most nests in South Oso Flaco are provided a small single-nest exclosure (7-foot circular or mini exclosure) and the symbolic fencing is moved west, as necessary and appropriate, to provide a buffer from the nest while still allowing pedestrians to recreate on the beach. Finally, additional fencing (i.e. bumpout) will be installed to enlarge the Southern Exclosure if necessary, and single-nest exclosures are installed for open riding area nests, to ensure dogs do not encroach within 100 feet of SNPL nests. The buffer will be increased, as necessary, until monitors observe that SNPL adults are no longer disturbed. In addition, dogs are

required to be kept on a leash no longer than 6 feet and under the control of their owner at all times, this includes service dogs. CDPR staff also strictly enforce the dog leash regulation in any area where dog activity could impact nesting SNPL. As a result, the effects of dogs on nesting SNPL are considered minimal.

Unleashed dogs can chase SNPL chicks and adults, cause chicks to become separated from adults, and trample nests. Unrestrained dogs can traverse a much larger area and thereby disrupt a greater number of birds and/or trample more nests. Several instances of nests lost to dogs have been reported along Monterey Bay (USFWS 2007a). Adverse effects on SNPL from unleashed dogs are considered minimal within the HCP area because dogs are not allowed within the Exclosures or South Oso Flaco area where the majority of SNPL nest and forage. In addition, CDPR staff strictly enforce the 6-foot dog leash regulation in any area where dog activity could impact nesting or brooding SNPL. However, occasionally, a dog has been observed off leash along the shoreline of the Exclosures in the HCP area where it may impact SNPL adults, chicks, or eggs.

Foraging and/or Roosting Disturbance – Non-breeding Season. A study in Santa Barbara County found wintering SNPL were more likely to fly from dogs than from humans (Lafferty 2001b). Repeated disturbance to wintering SNPL can reduce the amount of foraging and roosting time and increase the amount of energy spent and stress. This can alter the birds' ability to survive the winter and breed the following summer. To reduce this impact, CDPR will continue to require dogs to be kept on a leash no longer than 6 feet and under the control of their owner at all times within the HCP area, and CDPR staff will strictly enforce this regulation in areas where wintering SNPL have been observed roosting and/or foraging.

4.3.1.1.7 Equestrian Recreation (CA-7)

Nesting and Brooding Impacts. Most of the breeding SNPL population within the HCP area nests within the Exclosures. Horses are not allowed in the Exclosures or South Oso Flaco. Therefore, SNPL adults, eggs, and chicks within these areas are protected from direct impacts (e.g., eggs being crushed) from horses.

Most equestrian activity occurs in the northern portion of the HCP area and other areas where SNPL are unlikely to nest. If equestrian activity occurred in areas where SNPL nest or if a SNPL nested outside the Exclosures in an area where equestrian activity is allowed, it would generally have the same types of effects on nesting SNPL as pedestrians (section 4.3.1.1.3). Monitors have documented at least four SNPL clutches on Morro Spit, California, that were destroyed by horses trampling the nests (Persons and Ellison 2001 as cited in (ICF International 2010). To reduce the impacts from equestrian activity, CDPR will continue to implement the SNPL and CLTE management program, which includes installing additional fencing (i.e., bumpouts) on the Southern Exclosure, if necessary, to ensure that equestrian activities do not disturb nesting SNPL. Monitors will also continue to search daily for SNPL nests outside the Exclosures and protect them with a single-nest exclosure, as necessary and appropriate. In addition, large single-nest exclosures to provide a 100-foot buffer from nests are installed for open riding area nests to ensure that recreation activities do not disturb nesting SNPL. As a result, the effects on nesting SNPL from equestrian recreation are considered to be minimal.

Foraging and/or Roosting Disturbance. Equestrian activity can disturb foraging SNPL during the breeding and non-breeding seasons in a similar manner as described for pedestrian activities (section 4.3.1.1.3). Equestrian activity during the breeding season typically occurs outside areas where SNPL are known to forage; however, during the non-breeding season, SNPL forage in areas where there is equestrian activity (i.e., Post 2 to Grand Avenue). When equestrian activity occurs in SNPL foraging habitat (e.g., near Post 2 during the non-breeding season), disturbance of foraging SNPL is likely limited due to the short duration of disturbance caused by equestrian recreation. A study in Santa Barbara

County found that horses (in addition to dogs, humans, crows and other birds) disturb SNPL (Lafferty 2001b). However, adult SNPL typically move from the area to other available foraging habitat. CDPR will also continue to implement the SNPL and CLTE management program, which includes handing out educational materials on SNPL to visitors, including horseback riders, in the HCP area to prevent visitors from disturbing SNPL. Equestrian activities will continue to have minimal impacts on foraging SNPL.

Reduced Habitat Quality. At some SNPL nesting sites, equestrian activity can degrade the quality of habitat because horses leave depressions in an otherwise naturally flat, wave-washed shoreline, which can disrupt or impede the movement of chicks and adults (Neuman 2001), as cited in (ICF International 2010). If chicks are unable to climb out of the depressions, they become more vulnerable to recreation activities, energetically stressed, and/or emaciated. However, this impact likely doesn't occur in the HCP area because equestrian activity generally occurs in the northern portion of the HCP area outside of areas where SNPL chicks typically occur and equestrians are not allowed south of the riding boundary fence (e.g., Oso Flaco) where SNPL chicks do occur.

4.3.1.1.8 Boating/Surfing (CA-8)

Nesting and Brooding Impacts. Boaters and surfers do not affect breeding SNPL because the Exclosure shoreline is closed to boat landings, surfers, and paddleboarders during the breeding season. In addition, the shoreline of the 48-acre foredune shoreline is closed to the public when nests or broods are present.

Foraging and/or Roosting Disturbance. Surfing, small boat, and paddleboard launchings along the beach likely have similar effects on year-round roosting and foraging SNPL as pedestrians (section 4.3.1.1.3). Surfing, small boat, and paddleboard launching activities can displace wintering SNPL and/or breeding SNPL adults and/or broods from foraging along the shoreline outside the Exclosures. However, disturbance from kayakers, paddleboarders, and surfers is likely more limited than other pedestrian activities because these uses tend to be concentrated outside areas where SNPL typically occur, although surfers sometimes surf near Post 6, where SNPL can roost or forage.

Increased Predators. Surfing, small boats, and paddleboard launchings can also disturb gull flocks foraging on the shoreline and displace gulls into areas where SNPL nests or broods are located, thus increasing the risk of predation. However, in accordance with the Superintendent's Order (section 1.5.7), all surfing, boating, and paddleboarding activities are not allowed along the Exclosure's shoreline. CDPR will also continue to implement the SNPL and CLTE management program, which includes implementing a predator management program in the HCP area. As part of the ongoing predator management program, CDPR monitors and controls avian predators when necessary (section 2.2.2.1.2). As a result, this effect is considered to be minimal.

4.3.1.1.9 Aerial/Wind-Driven Activities (CA-9)

Nesting and Brooding Impacts. Biologists believe shorebirds may perceive kites and UAS as potential avian predators; therefore, kite flying, kiteboarding, and UAS may be extremely disruptive to nesting SNPL. Per Superintendent's Order, although wet launching and kite boarding in the water is allowed to Post 6 year-round, dry land launching and landing is only permitted between Pismo Creek and Pier Ave. Additionally, a Superintendent's Order (section 1.5.7) prohibits kite flying and UAS operation south of Pier Avenue during the SNPL breeding season. If nests are found in the 48-acre foredune, the shoreline is closed to the public, and the Superintendent's Order may be modified to further limit kiteboarding to protect SNPL. As a result, disturbance due to kite flying, kiteboarding, or UAS does not affect nesting SNPL.

SNPL chicks have been shown to lie motionless in response to avian predators (Colwell, Hurley, et al. 2007). If chicks respond to kites or UAS in the same way as potential avian predators and lie motionless

when a kite or UAS is near, then chicks may be more vulnerable to vehicle strike and predation during this time. However, kite and UAS flying is not allowed south of Pier Avenue during the nesting season, and kiteboarding is not allowed south of Post 6 where the majority of chicks are expected to forage (section 1.5.7). CDPR will also continue to implement the SNPL and CLTE management program, including having monitors conducting daily searches for and monitoring of SNPL broods in suitable habitat outside the Exclosures. As a result, impacts from aerial and wind-driven activities are considered minimal.

Foraging and/or Roosting Disturbance – Non-breeding Season. Where it is allowed, kite flying, kiteboarding, and/or UAS can disturb roosting or foraging adult SNPL during the non-breeding season, especially in areas where SNPL are known to roost (e.g., between Post 1 and Post 2). Disturbance from kites can cause SNPL to continually flush or move from the area, which can result in increased vigilance or stress and/or decreased foraging. However, adult SNPL typically move from the area to other available foraging habitat; therefore, this impact is considered to be minimal. In addition, even in the non-breeding season, kiteboarders rarely make it as far south as Oso Flaco. Therefore, any roosting or wintering SNPL south of Oso Flaco are not likely disturbed. Although UAS could disturb foraging SNPL, the birds can move, and CDPR staff have not observed significant UAS use in the HCP area, including around SNPL. Although not expected based on observations of UAS use in the HCP area, the Superintendent's Order will be modified to restrict the time and/or place for UAS use should CDPR staff observe conflict arising between UAS use and SNPL. This impact is considered minimal.

4.3.1.1.10 Holidays (CA-10)

Vehicle Impacts. Oceano Dunes SVRA closes the park to additional vehicles once the limits prescribed by the Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) are reached on any holiday. As a result, the effects of motor vehicles on holidays do not change from those discussed in section 4.3.1.1.1.

Nesting, Brooding, and Foraging Impacts. Studies in California have shown that more SNPL chicks are lost on weekends and holidays than on weekdays. This suggests that increased recreational activity is linked to increased chick loss (Ruhlen, Abbott and Page 2003). Pedestrians are not subject to limits in the HCP area, and some holidays (e.g., the July 4 holiday) attract large pedestrian crowds to area beaches. Effects from increased crowds are similar to those described for pedestrian activities (section 4.3.1.1.3), but the amount and type of disturbance can be more frequent and/or longer in duration. High levels of pedestrian traffic can cause repeated flushing of adults. Frequent flushing of adults can keep adults from brooding chicks, thus increasing thermoregulatory costs and potentially reducing rates of development and/or increasing their vulnerability to predators and inclement weather. Additionally, suspended feeding and expenditure of energy during repeated flushing can affect reproduction and survival of adults and chicks (Lafferty 2001a). To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitoring within the HCP area will be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. In addition, CDPR staff will continue to hand out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing SNPL nests and chicks. As a result, any increased impacts from holidays are considered to be minimal.

Fireworks are prohibited in the HCP area; however, once a year the City of Pismo Beach has a fireworks display on July 4 on the Pismo Beach pier. Therefore, during the July 4 holiday, many spectators congregate in the northern portion of the HCP area, which is over 2 miles from the northern edge of the Southern Exclosure. As a result, crowds associated with the City of Pismo Beach fireworks display are located in areas where they likely don't affect breeding SNPL. However, SNPL are largely precluded from foraging and roosting in areas that are heavily congested during the fireworks displays (e.g., the area north of Grand Avenue). In addition, although fireworks are illegal in the HCP area, some illegal

fireworks have been regularly observed during the July 4 week in or near SNPL breeding habitat, and have been observed disturbing nesting, roosting, and/or foraging SNPL. Disturbance from fireworks causes SNPL to flush or move from the area, which results in increased vigilance or stress, decreased foraging, and/or decreased brooding. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. To minimize potential illegal fireworks use and any effects from increased crowds due to legal fireworks, CDPR will continue to employ additional ranger staff at Oceano Dunes SVRA to enforce regulations during the July 4 holiday. In addition, CDPR will continue to increase staff near the Southern Exclosure to reduce illegal firework use in this area. Therefore, effects from fireworks or other actions that can disturb breeding SNPL during the July 4 holiday are reduced.

4.3.1.1.11 Special Events (CA-11)

As with holidays, the vehicle limits prescribed by Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) are not exceeded during special events, and Special Event Permits do not authorize activities in areas that will otherwise be closed to visitors. Thus, the potential for a given special event to affect SNPL depends on the nature of the event being approved and is generally similar to non-special event activities. For example, the effects of a special event involving OHVs is the same as the effects of typical motorized recreation (section 4.3.1.1.1), and a wedding or family reunion near Grand Avenue has effects similar to pedestrian activities (section 4.3.1.1.3).

Special events are potentially different from typical non-special event activities in a few ways. First, many events tend to focus participants in the event area, which can mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Effects on SNPL from concentrating spectators and vendors in an area is similar to the effects described for motorized recreation (section 4.3.1.1.1) and/or pedestrian recreation (section 4.3.1.1.3); however, the effects can be more frequent during the event and/or longer in duration due to the increased number of visitors. Second, special events change use patterns and increase visitation on days that might normally not be at capacity; however, the effects from this difference are likely not any different than those described above, depending on the activities associated with the event. Special events are evaluated for potential effects on covered species to determine whether AMMs are necessary to include in the permit conditions. Review is based on past experience and is dependent on the event location, timing, and potential to impact covered species like SNPL. For example, larger special event conditions may include AMMs such as assigning trained SNPL monitors or additional enforcement staff or adjusting scheduling, location, or paths of travel, as necessary, for each event. With the implementation of AMMs during special events, impacts from special events are considered to be minimal.

UAS may be used in the future for video production within the HCP area. UAS will not be allowed near nesting areas during the breeding season. Therefore, UAS are not expected to affect nesting SNPL. UAS could disturb SNPL foraging and/or roosting in the HCP area during the non-breeding season. However, Wilson et. al. (2023) assessed responses to drones by a variety of shorebirds and found most species are unlikely to take flight, especially when flights are at higher distances (above 197 feet). A previous study by (Vas, et al. 2015) assessed reactions by a variety of waterbirds to approaches by drones and found that the birds remained unaffected in most cases, suggesting the potential to use drones without significant disturbance. In addition, to ensure disturbance to foraging and/or roosting SNPL from UAS operations is minimized, all UAS operators will be required to obtain a permit to operate over CDPR lands. As part of the permit to operate, any UAS operator will be required to follow AMMs to reduce impacts to SNPL. For example, during the breeding season, UAS will not be allowed along the shoreline south of Pier Avenue, including the open riding area, Southern Exclosure, and Oso Flaco area. In addition, a trained SNPL monitor will accompany UAS operators at any time of the year if it is

determined there is potential to impact covered species. As a result, impacts of UAS operations to foraging and/or roosting SNPL are expected to be minimal.

4.3.1.2 Natural Resources Management Program

4.3.1.2.1 Covered Species Management

Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (CA-12a)

Seasonal Exclosure and Symbolic Fencing

Seasonal exclosure and symbolic fencing are installed and maintained in the HCP area each breeding season as part of the ongoing SNPL and CLTE management program. Fencing for the Exclosures and symbolic fencing is installed by March 1, which is well before SNPL nests are typically found, and it is removed starting October 1, which is after the date when all nests and broods have a known fate and the breeding season has ended. As a result, initial installation and removal of the seasonal exclosure and symbolic fencing does not affect nesting SNPL.

Vehicle Strike. Seasonal exclosure fence and symbolic fencing must be maintained throughout the breeding season to ensure integrity against terrestrial predators and human disturbance. Bumpouts are also installed to further protect nests from human disturbance, when needed. Fence maintenance is conducted by hand or by heavy equipment and may have different intensity of impacts depending on the method. Maintenance of the fence can occur multiple times in a week and may involve extended or repeated visits to the nesting sites. Maintenance vehicles may occasionally need to drive on the Southern Exclosure shoreline, within bumpouts, and very infrequently may also need to drive just inside the seasonal exclosure to access the eastern fence. However, to minimize the risk of maintenance vehicles striking a SNPL, nest, or chick while driving within the Southern Exclosure or bumpouts, CDPR staff are escorted by monitors permitted by USFWS. If SNPL are nesting nearby, have broods present, or otherwise observed to be disturbed, maintenance work will be delayed or cancelled. In addition, CDPR staff are trained to operate a vehicle on the closed shoreline or other areas where SNPL broods may be present, including scanning ahead of the vehicle for SNPL, driving where chicks are less likely to occur, avoiding wrack, keeping speeds at or below 5 mph, and in some cases avoiding driving the shoreline during high tides. As a result, effects are considered minimal.

Nesting and Brooding Disturbance. Both heavy equipment and hand maintenance of the fence and bumpout installation can disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks can be depredated, inadequately fed, or flushed into the open riding area. Maintenance using heavy equipment is typically shorter in duration than maintenance by hand and thus likely results in less impact to nesting SNPL than hand maintenance. In addition, effects from seasonal exclosure and symbolic fence maintenance have been minimal in the past due to the implementation of established protocols in the SNPL and CLTE management program. Specifically, fence maintenance and bumpout installation are timed to avoid extremely windy periods or other inclement weather. In addition, monitors conduct a survey prior to conducting fence maintenance activities. If a nesting SNPL could be impacted by activities, monitors postpone maintenance in the vicinity of the nest, if appropriate, or remain on site during fence maintenance/installation to minimize disruption to SNPL. Furthermore, if chicks are flushed out of the Southern Exclosure and into the open riding area during fence maintenance and/or bumpout installation, monitors attempt to follow and protect the chicks until they move back inside the exclosure. Overall, fenced protected areas have been shown to increase SNPL and other shorebird reproductive success in other locations (Isaksson,

Wallander and Larsson 2007, Hardy and Colwell 2008, Wilson and Colwell 2010, Pearson, Knapp and Sundstrom 2014). In the HCP area, reproductive success has increased since the implementation of the SNPL and CLTE management program, including the use of the seasonal exclosure and symbolic fencing; therefore, the seasonal exclosure and symbolic fencing have provided a considerable benefit to SNPL.

Fence Strike. Fences placed in otherwise open habitat can be hazardous to flying birds. Shorebirds have been observed being killed upon striking cable (symbolic) fences at other sites (Page, Warriner, et al. 2002). Although infrequent, monitors at Oceano Dunes SVRA have observed SNPL striking the seasonal exclosure fence while flying (CDPR 2014a). In 2015, CDPR experimented with placing thick plastic fencing (orange silt construction fencing cut into approximately 1-foot sections) to the top of the seasonal exclosure fence to increase the visibility of the fence for flying CLTE. The orange fencing also benefits SNPL and was placed on the western and northern seasonal exclosure (6 and 7 Exclosures and part of 8 Exclosure) fence from 2016 to 2023 with favorable results. CDPR will continue to implement this program by lining the top of the seasonal exclosure fence with a strip of thick plastic fencing in March of each year, along most of the western and northern Southern Exclosure fenced areas. If staff resources are available, some of the eastern fenceline and bumpout fencing may also be lined with this strip fencing. Therefore, it is anticipated the visible fencing will continue to reduce the likelihood of a SNPL striking a fence in areas where it is installed. SNPL are known to nest in the Oso Flaco area and can still strike symbolic fencing in this area. However, this event has rarely been documented since the implementation of the SNPL and CLTE management program. As a result, this event will continue to be rare. Overall, the seasonal exclosure fence is an important protective measure that has increased SNPL reproductive success in the HCP area. Therefore, the seasonal exclosure fence will continue to be used despite the potential for birds to strike the fence.

The exclosure fence and other fencing is intended to protect the nesting area from public entry and to protect breeding areas from certain predators. While the installation, removal, and hand maintenance of the exclosure fencing is considered a recovery activity under the USFWS Recovery Permit, injury, mortality, or other incidental take from fence strikes will be covered by this HCP and not through permit TE-815214-10.

Single-Nest and Other Small Exclosures

Nesting and Brooding Disturbance. Single-nest exclosures are installed and maintained in the HCP area as part of the ongoing SNPL and CLTE management program. Installation of SNPL single-nest exclosures can be highly disruptive to SNPL as adults are often displaced from incubation for the duration of the exclosure construction. Melvin et al. (1992) found that plovers returned to the exclosure and completed the clutch when exclosures were placed around incomplete clutches of at least three eggs, indicating that individuals are less likely to abandon a nest when the clutch is close to completion. Therefore, as part of the protocol associated with the ongoing SNPL and CLTE management program in the HCP area, monitors typically attempt to minimize the risk of abandonment when erecting single-nest exclosures around SNPL nests in non-motorized areas by waiting until at least two eggs are present in the nest or consistent incubation is observed. However, because there is greater risk to the nest from motorized activity in the riding area than from the installation of the exclosure, single-nest exclosures are installed as soon as feasible once a nest is discovered in the riding area. Additional AMMs that are implemented as part of the ongoing SNPL and CLTE management program that will continue to be implemented include having only USFWS-approved biologists install the exclosure, timing the installation of the exclosure to avoid extremely windy periods, installing the exclosures within timelines established within existing federal permits, and monitoring the nest after exclosure installation to ensure the adult returns to the nest. Overall, single-nest exclosures have been beneficial to nesting SNPL and protect nests from the impacts of recreation and predation.

Fence Strike. While mesh tops that are installed on the tops of the small single-nest exclosure protect SNPL nests from predators, the mesh top itself poses a collision or entanglement risk to adult SNPL. One adult SNPL in the HCP area died in 2004 after becoming entangled in a mesh exclosure top. That net top was a large mesh (4-inch by 4-inch) that is no longer used in the HCP area. A smaller mesh of 0.5-inch by 0.5-inch has been used since 2005, but even this smaller mesh top still poses a risk of entanglement for adult SNPL. Although SNPL entanglement within these mesh tops has not been observed in the HCP area, monitors in the HCP area carefully approach nests in exclosures with mesh tops to avoid startling the SNPL on the nest and minimize the risk of entanglement. In addition, this risk is likely minimal since SNPL usually leave the exclosures by walking or running rather than flying (Melvin, MacIvor and Griffin 1992).

Single-nest and mini exclosures are intended to protect individual nests from public entry and from certain predators. While the installation of small single-nest exclosures is considered a recovery activity under the USFWS Recovery Permit, injury, mortality, or other forms of incidental take from fence strikes will be covered by this HCP and not through permit TE-815214-10.

Increased Predators. Single-nest exclosures can also pose a risk to incubating adult SNPL because they may increase the likelihood that predators will recognize the exclosure and prey on the attending adults. Murphy et al. (2003) showed that nest exclosures had a negative effect on the survival of adult piping plovers (*Charadrius melodus*). Isaksson et al. (2007) found that nest exclosures increased predation on incubating adult redshanks (*Tringa totanus*). Similarly, Watts et al. (2012) observed an increase in adult SNPL mortality in 2006 in Humboldt County that was caused by the presence of nest exclosures; however, it is unknown whether this was an isolated occurrence. During monitoring efforts associated with the SNPL and CLTE management program, CDPR monitors have observed or suspected predation of SNPL at small single-nest and mini exclosures within the HCP area. To reduce this impact within the HCP area, CDPR staff implements established protocols to minimize the likelihood that a predator can key in on small single-nest or mini exclosures and depredate SNPL adults or nests. Specifically, small single-nest and mini exclosures are closely monitored to evaluate their effectiveness and ensure substantial adult mortality due to predation at the exclosure does not occur. If predation is suspected, CDPR will attempt to trap/remove the predator, and monitors may remove the small single-nest or mini exclosures in the area if necessary to prevent additional predation. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL at a large single-nest exclosure. Based on SNPL and CLTE Annual Breeding Season Reports (Appendix G) since the implementation of these established protocols, the protocols have been successful at reducing predation at small nest exclosures; however, some predation still occurs and will continue to occur at these exclosures.

Small single-nest and mini exclosures are intended to protect individual nests from public entry and from certain predators. Impacts to adults, juveniles, chicks and eggs from these small single-nest exclosures from increased predation or nest abandonment will continue to be authorized under the USFWS Recovery Permit TE-815214-10.

Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Monitoring

Vehicle Strike. Although most SNPL nest within the Exclosures in the HCP area, some SNPL have been observed nesting in the riding area. While driving to access the Exclosures, monitors or their vehicles can crush a chick or nest outside the Exclosures if an SNPL nest has not yet discovered. In addition, a monitor vehicle could crush a chick that is foraging or being brooded on the shoreline if the monitor does not see them. To reduce this risk, monitors in the HCP area follow established protocols to

minimize adverse effects on nesting SNPL. This includes monitors conducting early morning scans of the perimeter of the Southern Exclosure and other areas where nests may be present (e.g., 48-acre foredune area) to locate chicks that may have moved into the open riding area during the night. If chicks are found, they are monitored and carefully directed by staff back to exclosure. Monitoring on the Exclosures shoreline is conducted by experienced staff who are authorized by the USFWS to conduct the monitoring and/or who work under the specific requirements of the 10(a)(1)(A) Recovery Permit (USFWS-approved). These USFWS-approved monitors keep speeds below 5 mph along the Exclosures shoreline, scanning ahead of the vehicle for SNPL, and avoid driving in the wrack so it is less likely that there will be impacts to nests or chicks. Monitors will continue to follow established protocols when conducting monitoring activities. Therefore, this impact is not likely to occur.

Nesting and Brooding Impacts. Monitoring of SNPL has been conducted in the HCP area since 1992, although the methods have been modified over the years to ensure the monitoring is effective. Monitoring activities involve extended or repeated visits to SNPL nesting sites, which can disrupt nesting birds by keeping them off their nests, separating broods, scaring chicks into the open riding area, and exposing birds to inclement weather and predators. In addition, the practice of floating SNPL eggs to estimate hatch date could damage the eggs themselves and disturb attending adults at the nest. MacIvor et al. (1990) found that regular monitoring of piping plover nests and trapping at the nest did not lead to increased nest predation. Similarly, Galbraith (1987) found that clutch survival of lapwings (*Vanellus vanellus*) was not affected by marking and visiting nests or by handling eggs. Within the HCP area, CDPR staff implement established protocols during monitoring to minimize adverse effects of monitors on nesting SNPL. In addition, staff entering the Southern Exclosure to monitor nests or broods must have a 10(a)(1)(A) Recovery Permit or be approved by the USFWS. Based on SNPL and CLTE Annual Breeding Season Reports (Appendix G) in the HCP area since the implementation of the SNPL and CLTE management program, the protocols have been successful at increasing SNPL reproductive success. Therefore, monitoring of nests, when carried out by experienced and permitted biologists/Natural Resource staff as is done in the HCP area, benefits SNPL by increasing the number of SNPL eggs and chicks found and by providing information that is critical to the conservation and protection of the species.

Monitoring activities in the HCP area can flush chicks into the territory of a neighboring nest or brood. Monitors in the HCP area have observed adult SNPL acting aggressively toward chicks that approach their nests or chicks. In a few instances, injury or death of the chick has resulted (CDPR 2015a). To reduce this risk, CDPR follows established protocols as part of the SNPL and CLTE management program when entering the Exclosures. Specifically, staff are aware of the location of broods and nests, and adults and brood movement is monitored closely anytime staff that enter the Exclosures to minimize situations where a brood may move into the territory of another nest or brood and to prevent separation or injury of chicks. However, adult aggression or separation of chicks may still occur, particularly if the population in the HCP area continues to increase.

Within the HCP area, cameras are sometimes installed at SNPL nests to document nest predators. Cameras have been effective for identifying nest predators in other locations in California (Demers and Robinson-Nilsen 2012). While they collect useful data on nesting SNPL, cameras that are used to monitor nests need to be maintained, which can cause additional disturbance when the monitors approach the cameras to maintain them. In addition, the cameras may be spotted by potential SNPL predators and alert these predators to the location of nearby nests. However, in other studies that used cameras to monitor nests, the presence of cameras did not appear to influence nesting success or attract predators to the nest (Brown, Jansen and Innes 1998, Demers and Robinson-Nilsen 2012). Cameras have not been observed influencing nest success in the HCP area to date. To ensure effects from cameras are minimized, CDPR will also continue to implement the SNPL and CLTE management

program, which includes AMMs to be implemented while using still or video cameras, such as training monitors on how to install cameras, not installing cameras when the wind speed is above 15 mph or strong enough to move sand or if it is raining, waiting to deploy cameras if a predator sighting recently occurred, and not installing cameras on nests that are readily visible to the public. As a result, the effects of using cameras near SNPL nests are considered to be minimal.

Collecting SNPL chicks and eggs requires handling chicks and/or eggs to relocate them to an authorized wildlife facility. This activity can also result in increased stress and vigilance of chicks while monitors attempt to capture the chicks. In addition, captive rearing is not always successful, and eggs or chicks may not survive in the captive facility. Despite this potential outcome, captive rearing has been documented as successful in a few studies (Powell and Cuthbert 1993, Powell, Cuthbert and Wemmer, et al. 1997, Neuman, Stenzel, et al. 2013) and, even in studies where survival of captive-reared young is low, proponents of the technique point out that even small numbers that survive and breed indicate some success toward conservation of the species since otherwise the eggs or chicks would not have survived (Roche, Cuthbert and Arnold 2008, Neuman, Stenzel, et al. 2013). In the past (2003 – 2023), approximately 147 eggs and 38 chicks within the HCP area have been salvaged when they were found abandoned or injured. A portion of these individuals have survived to fledging age in a captive rearing facility. These fledglings have been released back into the wild and many were documented as integrating into the wild SNPL population and breeding, although not necessarily within the HCP area. As a result, salvaging SNPL eggs and chicks will continue to be beneficial to the individuals removed, and if they go on to breed, will benefit SNPL overall.

Any impacts from monitoring SNPL will continue to be authorized under Recovery Permit TE-815214-10.

Banding

Chick Impacts. Leg bands are commonly used to mark shorebird chicks. SNPL chicks in the HCP area have been banded as young as the day of hatch since 2000. Banding SNPL chicks results in capture of the chicks and could lead to injury or death; however, studies of piping plovers in the Great Lakes indicate that banding has no detrimental effect on the survival of the chicks to fledging (Roche, Arnold, et al. 2010). To minimize the risk of injury or mortality during banding activities, CDPR implements established protocols associated with the SNPL and CLTE management program. Specifically, CDPR uses appointed staff that have obtained the appropriate state and federal permits to band SNPL chicks in the HCP area. Monitors will be aware of the location of nests and broods and track chicks closely during banding activities to minimize situations where a brood may move into the territory of another nest or brood and to prevent separation or injury of chicks. Captured chicks are assessed by the bander, and any chicks showing abnormal health or behavior may not be banded. In addition, if a bird shows signs of leg injury due to bands, monitors capture and take the bird to a veterinarian for treatment and proper removal of bands. No injuries or mortalities have been reported during banding activities in the HCP area to date. As a result, injuries or mortality associated with banding activities in the future are not expected.

Some SNPL have been observed in the HCP area with leg injuries from unknown causes. Although the causes of the leg injury have not been determined, these injuries could be from leg bands. As part of the ongoing SNPL and CLTE management program in the HCP area, to minimize the risk of additional injury and mortality associated with leg bands, monitors capture birds that show signs of leg injury due to bands to assess if medical treatment is needed. For example, in 2017 a banded adult was observed with a slight limp, and when captured, the right leg bands were not moving freely. The bird was taken to a wildlife center, the leg bands were removed, and the leg was treated. A few weeks later the bird's leg had improved and the bird was released back in the HCP area. Leg injuries that can be attributed to leg bands have been infrequent in the past and are expected to continue to be infrequent.

Adult Impacts. Currently, adult SNPL are not banded in the HCP area; however, the Oceano Dunes District may band adults at a later date if determined to be necessary to monitor the breeding population. Banding adults could pose risk of injury or mortality to adults. In addition, banding could substantially disturb nesting SNPL and ultimately cause them to abandon their eggs or chicks. To reduce these impacts, CDPR will implement established protocols during banding in accordance with the SNPL and CLTE management program. Specifically, appointed staff that have obtained the appropriate state and federal permits conduct banding activities. In addition, monitors and appointed permitted banders that enter the Exclosures will be required to have a 10(a)(1)(A) Recovery Permit and/or be approved by the USFWS and follow careful protocols designed to minimize any adverse effects on SNPL during these activities. Furthermore, when entering the Exclosures, monitors will be aware of the location of nests and broods, and track chicks closely. As a result, the effects from banding adults are expected to be minimal.

Any impacts from banding SNPL will continue to be authorized under Recovery Permit TE-815214-10.

Predator Control

Nesting and Brooding Impacts. A predator management program has been implemented as part of the ongoing SNPL and CLTE management program in the HCP area since 2002. Control of both avian and mammalian predators has been shown to increase chick survival in other shorebirds and SNPL (Neuman, Page and Stenzel, et al. 2004, Catlin, Felio and Fraser 2011). However, control of both avian and mammalian predators (e.g., hazing, live trapping, or lethal removal) can result in negative effects on SNPL. Predator removal may require a predator specialist to enter the Exclosures and/or remain in an area for a prolonged period of time to set and monitor predator traps. These effects are similar to the effects of monitoring activities and can result in disrupting nesting birds by keeping them off their nest, separating broods, displacing or moving chicks into the open riding area, and exposing birds to inclement weather and predators. In order to reduce effects on SNPL, CDPR implements established protocols as part of the SNPL and CLTE management program. Specifically, predator specialists that enter a closed nesting area are either accompanied by a qualified biologist/Natural Resource staff or have been approved by the USFWS to enter the nesting area. Predator specialists also consult with monitors prior to entering a nesting area, are provided with information on SNPL in the HCP area, and are made aware of the location of nests and broods in order to determine allowable trapping locations that will minimize situations where a brood or incubating adult could be disturbed. Monitors also observe the open riding area during any activities that could result in chicks leaving the Southern Exclosure to ensure no chicks flush into the open riding area during activities. If chicks move into the open riding area, monitors control traffic and ensure that chicks move safely back into the non-vehicle use area. Overall, the predator management program appears to have had beneficial effects and has likely increased the overall population (i.e., number of breeding adults) and reproductive success (i.e., number of fledglings per nesting pair) for SNPL in the HCP area. As a result, predator management will continue to benefit SNPL in the HCP area.

Any impacts from predator control activities will continue to be authorized under Recovery Permit TE-815214-10.

Habitat Enhancement

Nesting and Brooding Disturbance. Habitat enhancement has been implemented each year in the HCP area as part of the ongoing SNPL and CLTE management program. Transporting and installing the materials used for habitat enhancement measures (e.g., enhancing wrack, adding woodchips) is implemented prior to the start of the breeding season and at the end of the breeding season. To the extent feasible, this work is conducted immediately before the seasonal exclosure is removed when all

nests have hatched and chicks confirmed to have fledged to avoid impacting nesting SNPL. Habitat manipulation would only be conducted outside the breeding season. Therefore, with the exception of the following habitat enhancement activities, these activities do not affect breeding SNPL.

A limited number of habitat enhancement activities occur on the Southern Exclosure shoreline (e.g., collecting and depositing wood pieces, wrack, and beach hoppers/talitrids) during the breeding season. The effects are similar to those from monitoring activities and can result in disrupting nesting SNPL by keeping them off their nests, separating broods, and/or exposing birds to inclement weather and predators. In addition, foraging SNPL adults that are interrupted by humans have been observed to stop foraging and move away from the wrack until the disturbance has passed (Webber, Heath and Fischer 2013). To reduce impacts to SNPL, CDPR staff implements established protocols during habitat enhancement activities to minimize adverse effects of monitors on nesting SNPL. Specifically, monitors are aware of the location of nests, brood, and adults in order to minimize situations where a brood or incubating adult could be disturbed. In addition, only monitors approved by the USFWS or with a 10(a)(1)(A) Recovery Permit are permitted to collect or deposit materials on the exclosure shoreline. Overall, habitat enhancement has had a positive effect on SNPL by providing cover and other habitat improvements within breeding habitat. Therefore, habitat enhancement will continue to have an overall positive effect on SNPL.

Any impacts from routine habitat enhancement like seeds, wrack, woody debris, and protective cover will continue to be authorized under Recovery Permit TE-815214-10.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Routine habitat enhancement has limited effects on wintering SNPL, if any. Enhancement measures such as adding wrack and driftwood are limited in the winter and typically only occur after storm events when lots of wrack is present on the beach. Similarly, broadcasting seed and installing container plants only cause short-term disturbance. Habitat manipulation would be conducted during the non-breeding season subject to AMMs, including on-site monitors to ensure SNPL are not harmed by equipment. In addition, wintering SNPL typically move from the area to other available foraging habitat. These measures would ensure SNPL are not harmed during the manipulation activity; breeding SNPL would benefit from the improved site conditions.

CDPR will continue to adjust approaches to habitat enhancement in response to data collected, input from Wildlife Agencies and other resource specialists, and site conditions (see adaptive management described in section 5.5). Observations in the HCP area do indicate that once a foredune system creates significant topographic relief and dense vegetation, it is less productive for nesting SNPL and CLTE (CDPR 2023). Large portions of the Southern Exclosure have become less productive as the vegetation and topography have expanded and grown over time, causing reduced open habitat favored by nesting SNPL and CLTE. CDPR anticipates needing to remove during the non-breeding season the non-native sea rocket and larger dune hummocks in heavily vegetated areas where nesting has declined in the Southern Exclosure.

This type of habitat enhancement will involve the use of heavy equipment in areas that are seasonally used for nesting and that may provide non-breeding season roosting habitat. Impacts to SNPL will be avoided through the use of AMMs including conducting all habitat manipulation activities outside the breeding season. Even with the use of AMMs, the potential remains for heavy equipment to crush individuals, disrupt roosting birds, or otherwise disturb non-breeding adults or juveniles.

Any impacts from routine habitat enhancement like seeds, wrack, woody debris, and protective cover will be authorized under Recovery Permit TE-815214-10. Incidental take from larger habitat manipulation activities would be covered under the HCP.

Tidewater Goby and Salmonid Surveys (CA-13)

Nesting, Brooding, and Foraging Disturbance. Tidewater goby and salmonid surveys can occur within Pismo Creek and estuary; however, SNPL have only been observed nesting near Pismo Creek estuary one time (in 2009). Therefore, impacts to SNPL during the breeding season at Pismo Creek estuary are unlikely.

Tidewater goby and salmonid surveys in lower Arroyo Grande Creek, including the euryhaline lagoon/estuary, can occur up to four times during the SNPL breeding season. SNPL have been observed nesting adjacent to Arroyo Grande Creek in the past, but this is an infrequent occurrence. If SNPL are nesting immediately adjacent to the creek or lagoon, then fisheries monitoring/surveys can result in disturbance, vehicular collision, or crushing of nests or chicks, such as described above for SNPL monitoring (section 4.3.1.2.1). In addition, fish surveys can disturb foraging or roosting SNPL near Arroyo Grande Creek and estuary during the nesting season. Given that only four such surveys are conducted each year, the surveys are short in duration, survey staff includes personnel experienced with conducting fisheries surveys within SNPL habitat, and SNPL infrequently attempt to nest in the Arroyo Grande Creek area or near the lagoon, the likelihood of these surveys resulting in effects on nesting, foraging, or roosting SNPL is low. CDPR will also continue to implement the SNPL and CLTE management program in the HCP area to reduce impacts to SNPL. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is in the riding area, including the Arroyo Grande Creek area. In addition, fisheries surveys are not conducted if there is concern of disturbance to SNPL nests or broods. Similarly, tidewater goby salvage would not be conducted if it posed a risk to SNPL nests or broods. As a result, effects on SNPL from fisheries surveys during the breeding season are considered to be minimal.

SNPL rarely occur at Oso Flaco Lake; therefore, any tidewater goby surveys conducted at Oso Flaco Lake do not impact SNPL. A lagoon-like reach will sometimes form where Oso Flaco Creek flows out into the Pacific Ocean. When this happens, surveys for tidewater goby may occur within the Oso Flaco Lake/Creek area and thus within an area where SNPL can occur. Effects on SNPL from these surveys are similar to those discussed above for Arroyo Grande Creek and lagoon. Monitors will continue to conduct daily searches for nests in potential nesting habitat in Oso Flaco, and fisheries surveys are not conducted if there is concern of disturbance to SNPL nests or broods. In addition, fisheries survey staff includes personnel experienced with conducting fisheries surveys within SNPL habitat. As a result, effects on SNPL from fisheries surveys during the breeding season are considered to be minimal.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Non-breeding season SNPL flocks form near the Arroyo Grande Creek mouth and pooling water. If present during tidewater goby surveys, they would likely be flushed. However, any impacts are temporary and relatively short in duration and SNPL flocks typically relocate to another location or adapt to the minor disturbance. In addition, tidewater goby surveys are conducted by personnel experienced with conducting surveys within SNPL habitat. As a result, effects on SNPL flocks from fisheries surveys, including salvage efforts, during the non-breeding season are considered to be minimal.

Monitoring and Management for Listed Herpetological Resources (CA-14)

Nesting, Brooding, and Foraging Disturbance. Herpetological survey locations at Oso Flaco Lake, Little Oso Flaco Lake, Oceano Lagoon, Pismo State Beach Golf Course, and Meadow Creek and lagoon are located outside suitable SNPL nesting, foraging, and roosting habitat and thus do not affect SNPL.

Herpetological surveys can occur within Pismo Creek and estuary; however, SNPL have only been observed nesting near Pismo Creek estuary one time (in 2009). Therefore, impacts to SNPL during the breeding season at Pismo Creek estuary are unlikely.

Herpetological surveys in lower Arroyo Grande Creek and Estuary, can occur year-round, including during the SNPL breeding season. SNPL have been observed nesting adjacent to Arroyo Grande Creek in the past, but this is an infrequent occurrence. If SNPL are nesting immediately adjacent to the creek or lagoon, then CRLF/SWPT surveys can result in disturbance, vehicular collision, or crushing of nests or chicks, such as described above for SNPL monitoring. In addition, CRLF/SWPT surveys can disturb foraging or roosting SNPL near Arroyo Grande Creek and estuary during the breeding season. Given that the surveys are short in duration and that SNPL infrequently attempt to nest in the Arroyo Grande Creek area or near the lagoon/estuary, the likelihood of these surveys resulting in effects on nesting SNPL is low. CDPR will also continue to implement the SNPL and CLTE management program in the HCP area to ensure that these impacts are reduced. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat in the Arroyo Grande Creek area. In addition, herpetological surveys are not conducted if there is concern of disturbance to SNPL nests or broods. WSF surveys would be conducted during early winter to early spring rain events and would not affect breeding SNPL. Furthermore, herpetological survey staff includes personnel experienced with conducting surveys within SNPL habitat. As a result, effects on SNPL from herpetological surveys during the breeding season are considered to be minimal.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Non-breeding season SNPL flocks form near the Arroyo Grande Creek river mouth and pooling water. If present during herpetological surveys, it is likely they would be flushed. However, any impacts are temporary and relatively short in duration, and SNPL flocks typically relocate to another location or adapt to the minor disturbance. In addition, herpetological surveys are conducted by personnel experienced with conducting surveys within SNPL habitat. As a result, effects on SNPL flocks from such surveys during the non-breeding season are considered to be minimal.

Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Nesting, Brooding, and Foraging Disturbance. Monitoring for most listed plant species is conducted outside of the SNPL breeding season and/or habitat. Therefore, within the exception of the following listed plant monitoring activities, these activities have no effect on breeding SNPL.

Surf thistle and beach spectaclepod are known to occur within North and South Oso Flaco, where SNPL are known to nest, including within the seasonal exclosure and within symbolically fenced nesting areas (Map 21 and Map 22). Because of the timing of their blooming and growth periods, both plant species can only be accurately identified by doing surveys during the SNPL breeding season. These surveys can temporarily disturb nesting and/or foraging SNPL within North and South Oso Flaco in a similar manner as described for monitoring activities (section 4.3.1.2.1). However, since conducting surveys for these plant species requires entry into fenced nesting areas, the Oceano Dunes District has established detailed survey protocols in the Nesting Season Management Plan[46] (Appendix F), which is part of the ongoing SNPL and CLTE management program, to minimize effects on nesting and foraging SNPL. No destruction of eggs or mortality of chicks and/or adults have been observed during past surveys for surf thistle and beach spectaclepod in the HCP area. In addition, surveys for surf thistle and beach spectaclepod within or directly adjacent to the seasonal exclosure are conducted with a 10(a)(1)(A) SNPL and CLTE permitted (or a USFWS-approved) biologist, which has been successful at reducing disturbance to nesting and/or foraging SNPL. As a result, surveys conducted during the breeding season for surf thistle and beach spectaclepod would have minimal if any effects on nesting and/or foraging SNPL. Seed

[46] The Nesting Season Management Plan will be superseded by this HCP in the future and will, therefore, no longer be required.

collection for propagation would not be done within areas occupied by breeding SNPL, and any planting would be done outside the breeding season.

Foraging and/or Roosting Disturbance—Non-Breeding Season. Listed plant monitoring can result in disturbance to foraging and roosting SNPL during the non-breeding season. In addition, plant monitoring surveys can keep foraging and/or roosting SNPL from the area for the period of time the surveys are conducted. However, the plant monitoring surveys are short in duration (i.e., no longer than 15 minutes at each site), and CDPR will continue to implement the SNPL and CLTE management program. As a result, any disturbance from listed plant monitoring on foraging and roosting SNPL during the non-breeding season is considered to be very minimal.

4.3.1.2.2 Habitat Restoration Program (CA-16)

Nesting and Brooding Disturbance. Any planting of foredune plants and seeds within the Exclosures occurs by March, which is before SNPL begin to nest. Other habitat restoration and related activities, including fence maintenance, occur prior to SNPL breeding season to the extent feasible. If activities occur in the breeding season, they are planned to avoid areas where SNPL nest or raise broods. CalVTP and dune slack restoration activities will not occur in areas utilized by nesting or brooding SNPL.

Foraging and/or Roosting Disturbance—Non-breeding Season. Habitat restoration activities can disturb foraging and/or roosting SNPL during the non-breeding season, detering them from foraging and/or roosting in the area. However, restoration activities are typically short in duration and infrequent. As a result, any disturbance from restoration activities on foraging and/or roosting SNPL during the non-breeding season is likely minimal. CalVTP and dune slack restoration activities will not occur in areas likely to be utilized by foraging or roosting SNPL.

Reduced Habitat. If vegetation for restoration purposes is planted in and grows too densely within the footprint of the Exclosures or other primary and/or secondary suitable SNPL nesting habitat, it can reduce SNPL breeding habitat in these areas.[47] To reduce this impact, vegetation associated with the habitat restoration program is not planted beyond existing vegetated islands. CalVTP and dune slack restoration activities will not affect habitat utilized for nesting, brooding, foraging, or roosting. Therefore, impacts to SNPL breeding habitat are unlikely.

Increased Predators. Vegetation that is planted in the vicinity of known SNPL breeding, roosting, and/or foraging habitat can impact breeding SNPL by providing habitat for predators to hide and stalk nesting, foraging, and/or roosting SNPL. To reduce this impact, CDPR implements a predator management program that has been successful at controlling predators in the HCP area and protecting breeding SNPL. The predator management program has likely increased reproductive success and benefited SNPL and is expected to alleviate any impacts associated with any additional vegetation being planted near SNPL habitat. As a result, these effects are minimal.

4.3.1.2.3 Invasive Plant and Animal Control (CA-17)

Nesting and Brooding Disturbance. Actions taken to control invasive plants or animals during the SNPL breeding season do not occur near the Exclosures. In addition, control of invasive plants during the breeding season avoids areas where SNPL are known to nest or raise broods. Therefore, effects on nesting SNPL and broods do not occur.

[47] Installing plants at the start of the SNPL breeding season specifically to enhance breeding habitat is a separate action from habitat restoration [section 4.3.1.2.2]

Foraging and/or Roosting Disturbance. Invasive plant or animal control can occur in areas that may disturb roosting or foraging SNPL during the breeding season, such as near the Pismo Creek or Arroyo Grande Creek and Estuary. Invasive plant and animal control can disturb SNPL adults and deter them from foraging and/or roosting in the area. To reduce impacts to foraging and roosting adults from invasive plant or animal control, CDPR will continue to implement the SNPL and CLTE management program. Therefore, any invasive plant and animal control that needs to be conducted during the breeding season in or near SNPL foraging or roosting habitat will continue to be conducted when SNPL are not observed to be present. As a result, effects on foraging and/or roosting SNPL during the breeding season from invasive plant and animal control is considered to be minimal. In addition, invasive plants have been shown to prevent SNPL from nesting in otherwise suitable areas (Wiedemann 1984, Muir and Colwell 2010); therefore, removal of invasive plants ultimately improves native habitats and increases available SNPL breeding habitat in the HCP area.

Effects on wintering SNPL are considered unlikely since invasive plant and animal removal is not typically conducted in areas where wintering SNPL occur, and any activities that are conducted near wintering SNPL are short in duration.

4.3.1.2.4 Wildlife Habitat Protection Plan Implementation (CA-18)

The effects of the CLTE and SNPL, CRLF, tidewater goby, and listed plant monitoring programs, which are part of the WHPP, are described in the previous section (i.e., section 4.3.1.2.1).

Nesting and Brooding Disturbance. The effects of other components of the WHPP (e.g., vegetation monitoring, terrestrial bird monitoring, reptile and amphibian monitoring, small mammal monitoring, and large mammal monitoring) are limited because most WHPP monitoring that needs to be conducted in SNPL breeding habitat is implemented outside of the breeding season. WHPP activities that need to occur within the breeding season are described below.

Terrestrial bird monitoring occurs during the breeding season and small mammal monitoring may occur during the breeding season, with all surveys located within SNPL secondary and tertiary habitat. Between 2005 and 2023, only 62 SNPL nests were discovered in secondary habitat (Table 3-2, Map 11). Therefore, it is unlikely that any nests will be located near terrestrial bird and small mammal monitoring stations. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting daily searches for SNPL nests and broods in potential nesting habitat that is outside the Exclosures. WHPP monitoring surveys areas close to SNPL nesting and where SNPL may raise broods are avoided. Therefore, effects from terrestrial bird and small mammal monitoring are considered to be unlikely.

During the breeding season, monitors conduct three surveys for shorebirds along the shoreline of the HCP area, including in the Exclosures. These surveys can disturb nesting or brooding SNPL. As a result, the WHPP monitoring surveys within the shoreline areas of the Exclosures, South Oso Flaco, and of other areas potentially closed for nesting (e.g., 48-acre foredune area) are conducted by monitors with a 10(a)(1)(A) Recovery Permit (or approved by the USFWS). Therefore, disturbance caused by these surveys results in the same effects as those described for SNPL monitoring (section 4.3.1.2.4) and is considered to be very minimal.

Foraging and/or Roosting Disturbance. Non-breeding season WHPP surveys can disturb foraging or roosting wintering SNPL. Since monitors are experienced biologists and conduct surveys in a manner that minimizes disturbance on SNPL, any disturbance associated with WHPP monitoring is considered to be very minimal.

4.3.1.2.5 Water Quality Monitoring Projects (CA-19)

Nesting, Brooding, and Foraging Disturbance. Installation of water quality monitoring equipment occurs outside the SNPL breeding season; therefore, installation activities do not affect breeding SNPL.

Water quality monitoring equipment is currently installed at Oso Flaco Lake, which does not impact nesting, foraging, or roosting SNPL. Water quality monitoring equipment may be installed in other aquatic habitat in the HCP area in the future. Maintenance and/or installation of water quality monitoring equipment at Oso Flaco Creek, Pismo Creek, Arroyo Grande Creek, and associated estuaries will be timed to avoid disturbance to nesting SNPL to the extent feasible. However, some maintenance of water quality equipment may need to occur during the breeding season. Minor disturbance of nesting (e.g., near Arroyo Grande Creek), roosting, or foraging SNPL could occur near the estuaries. These effects are expected to be negligible given the short duration and minimal equipment required to conduct the maintenance and/or installation activities. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes having a trained SNPL monitor accompany water quality monitoring/maintenance staff to areas where SNPL could be present. As a result, effects on nesting, foraging, and roosting SNPL will be very minimal.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Disturbance of roosting or foraging SNPL could occur during water quality monitoring and installation of water quality equipment in the non-breeding season; however, these effects will be minimal due to the short duration of these activities.

4.3.1.3 Park Maintenance

4.3.1.3.1 Campground Maintenance (CA-20)

Campground maintenance activities do not affect SNPL since the designated campgrounds are not located within SNPL breeding or foraging habitat.

4.3.1.3.2 General Facilities Maintenance (CA-21)

Existing general maintenance activities do not occur within the Exclosures;[48] therefore, direct effects on SNPL nests within the exclosure do not occur. Existing general maintenance activities that can affect SNPL include litter pick-up, facility repairs, and restroom and signpost maintenance when these activities are located near SNPL primary and/or secondary nesting or foraging habitat.

Mechanical trash removal will only occur above the wrack line; therefore, mechanical trash removal is not expected to affect foraging SNPL along the shoreline. Mechanical trash removal operations are most effective in, and will target beach areas above, the high tide line where most human-use impacts are found. Mechanical trash removal operations will avoid high tide and wrack line disturbance, as well as creek mouth and lagoon areas. Mechanical trash removal will not occur within vegetated areas or within any fenced closed areas where SNPL nesting occurs (such as the Southern Exclosure or 48-acre foredune area); therefore, direct effects on SNPL nests within the closed areas will not occur.

Vehicle Strike – Breeding Season. Although infrequent, SNPL have been known to nest outside the Exclosures in areas where general maintenance activities occur, such as in the open riding area and near Arroyo Grande Creek (Map 11). General maintenance vehicles driving through habitat occupied by SNPL can strike individual chicks and/or adults that are in the riding area. A general maintenance vehicle can also crush eggs or chicks in an active SNPL nest that is outside the Exclosures and not yet identified by

[48] Effects associated with maintenance of the seasonal exclosure fencing are discussed in section 4.3.1.2.1.

monitors. To reduce the potential for vehicle strike, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, with monitors conducting daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate. In addition, all general maintenance staff will continue to receive training that includes life history information, measures, and rules that should be implemented to protect SNPL. All general maintenance staff will also continue to observe the park regulations and rules and CDPR staff are advised on how to operate a vehicle when SNPL broods are present. In addition, a USFWS-approved monitor escorts general maintenance vehicles along the Exclosures shoreline, and the 48-acre foredune area shoreline when nests or broods are present, with the monitor scanning ahead of the vehicle for SNPL, driving where chicks are less likely to occur, avoiding wrack, and keeping speeds along the shoreline at or below 5 mph. As a result, these impacts are considered to be minimal.

Mechanical trash removal activities are designed to avoid native beach plants, beach wrack, and any impacts to the natural physical and biological uses of beach wrack. The mechanical trash removal will not be conducted in any fenced closed areas where known SNPL nesting occurs (such as the Southern Exclosure or 48-acre foredune area); therefore, SNPL nesting habitat in these closed areas would not be impacted. Qualified biologists/Natural Resource staff will inspect and approve trash removal areas prior to each mechanical trash removal project, remaining on site or immediately available for monitoring. If any disturbances are observed to nesting, foraging, brooding, or roosting SNPL, appropriate avoidance measures will be determined at the discretion of the approved staff. Avoidance measures may include a delay in starting the project, finding an alternate project site, or canceling the project altogether. As a result, vehicle strike from mechanical trash removal is not expected.

Vehicle Strike and Disturbance – Non-Breeding Season. Many general maintenance activities occur within areas where SNPL do not typically forage and/or roost and thus do not affect foraging and/or roosting SNPL. Foraging and/or roosting SNPL can be disturbed by maintenance activities and/or struck by a maintenance vehicle traveling through or working within occupied foraging or roosting habitat during the non-breeding season. To reduce the potential for vehicle strike, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting a training for all general maintenance staff on SNPL and observing the park regulations and rules to protect SNPL. As a result, the impacts are considered to be minimal.

SNPL are known to winter in areas where mechanical trash removal may occur. If SNPL are foraging or roosting in areas where mechanical trash removal occurs, they could be temporarily disturbed by the activities and/or precluded from foraging and roosting in these areas. However, CDPR will implement AMMs, including conducting mechanical trash removal above the high tide line and avoiding all wrack and lagoons. Qualified biologists/Natural Resource staff will inspect and approve trash removal areas prior to each mechanical trash removal project, remaining on site or immediately available for monitoring. If any disturbances are observed to foraging or roosting SNPL, appropriate avoidance measures will be determined at the discretion of the approved staff. Avoidance measures may include a delay in starting the project, finding an alternate project site, or canceling the project altogether.

Mechanical trash removal activities have been explicitly designed to avoid flushing any roosting or foraging SNPL. Activities have also been designed to avoid native beach plants, beach wrack, and any impacts to the natural physical and biological uses of beach wrack. As a result, vehicle strike and disturbance during the non-breeding season are not expected.

Nesting and Brooding Disturbance. If general maintenance activities are conducted adjacent to fenced nesting areas (e.g., Exclosures, 48-acre foredune area, Oso Flaco), they can disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks from the nest and

separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated, and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys will continue to be conducted prior to performing maintenance activities near SNPL nesting areas. If SNPL are observed, maintenance activities will be delayed until an experienced monitor determines that SNPL will not be impacted. In addition, monitors will continue to escort maintenance workers along the shoreline closed for SNPL broods (i.e., south of Post 4.5, assuming the foredune shoreline is closed) to ensure disturbance to nesting SNPL is minimized. As a result, effects from general maintenance activities near the fenced nesting areas will be minimal.

Restroom facilities need to be maintained regularly during the breeding season. Most restroom facilities are located in secondary and/or tertiary habitat and have minimal to no impacts on nesting SNPL. In addition, those restrooms that are in primary habitat are located in areas that SNPL do not typically nest (i.e., outside the Exclosures). Furthermore, the Oceano Dunes District implements established protocol if SNPL establish a nest within 150 feet of these structures to ensure that restroom maintenance and public access at the restrooms do not disturb breeding SNPL. Specifically, permanent restroom buildings are closed to public use and fencing is erected around the restroom to isolate it and prevent public use. When nests are found between the 48-acre foredune area plots, the alleyway where the restroom is located is closed to the public by installing wire fencing on the eastern end of the alleyway. In addition, chemical toilets are relocated a minimum of 330 feet from any nest site, or other distance based on the best available site-specific information and in consultation with Wildlife Agencies. Therefore, the effect on SNPL from maintaining restroom structures is minimal.

Mechanical trash removal activities are designed to avoid known SNPL nesting areas (such as the Southern Exclosure or 48-acre foredune area). Qualified biologists/Natural Resource staff will inspect and approve trash removal areas prior to each mechanical trash removal project, remaining on site or immediately available for monitoring. If any disturbances are observed to nesting, foraging, brooding, or roosting SNPL, appropriate avoidance measures will be determined at the discretion of the approved staff. Avoidance measures may include a delay in starting the project, finding an alternate project site, or canceling the project altogether.

These measures will avoid disturbing nesting SNPL, including avoiding temporarily flushing brooding adults away from nests or chicks or flushing chicks from the nest and separating them from the attending adult.

Reduced Habitat. The placement of restroom facilities within SNPL breeding habitat reduces the amount of habitat available to SNPL for breeding by precluding them from nesting within the footprint of the structures. However, restroom facilities are small (i.e., approximately 8 feet by 8 feet), and they are placed in areas where SNPL do not typically nest (i.e., outside the Exclosures). Therefore, this effect is considered to be minimal.

Mechanical trash removal will not be conducted within vegetated areas or within any fenced closed areas where known SNPL nesting occurs (such as the Southern Exclosure or 48-acre foredune area); therefore, SNPL habitat will not be impacted by this activity and will remain undisturbed year-round. Mechanical trash removal could affect favorable SNPL nesting habitat (i.e., primary and secondary habitat) in the riding area by altering dune composition and topography. Specifically, mechanical trash removal could reduce micro-topography and/or organic surface materials (e.g., driftwood and campfire charcoal) that are scattered throughout the HCP area above the wrack line. Most mechanical trash removal will be conducted to remove litter in areas where recreation activities have been concentrated and the substrate is already highly disturbed. These areas have always supported marginally suitable

SNPL nesting habitat due to the ongoing high level of recreation (i.e., presence of humans, pets, vehicles, and/or human attracted predators).[49] As a result, this effect will be minimal.

Mechanical trash removal will not be conducted at or below the wrack line; therefore, these activities are not anticipated to impact any physical and biological features related to shoreline habitat areas for SNPL feeding (i.e., foraging habitat) at or below the wrack line. Although mechanical trash removal will only occur above the wrack line, mechanical trash removal could remove scattered debris (e.g., driftwood and dried kelp) from the previous winter wrack line still present in the beach area above the wrack line, which is likely important habitat for wrack-associated beach invertebrates. This material may not have time to naturally develop again, and species richness, abundance, and biomass of wrack-associated invertebrates that are important SNPL prey resources could decline. As a result, wintering SNPL could be impacted by a reduced prey source. Pre-identified and targeted locations are planned to be treated no more than twice a year unless additional treatments are found necessary and planned for appropriately. CDPR will implement AMM 109, which includes implementing a study to determine the impact of mechanical trash removal on wrack-associated invertebrates. If a substantial decline in invertebrates is observed, CDPR will implement additional measures to reduce the impact, such as reducing the frequency of mechanical trash removal, and/or reducing the mechanical trash removal locations. As a result, mechanical trash removal will have a minimal impact on wintering SNPL foraging opportunities and the quality of their habitat.

4.3.1.3.3 Trash Control (CA-22)

Installation and maintenance of small trash bins in the non-motorized portion of Pismo State Beach does not affect SNPL since the trash bins are installed near the parking areas and access points, outside of suitable nesting and foraging habitat for SNPL.

Nesting and Brooding Impacts. Because most of the large trash dumpsters are located in the dunes approximately 2 miles from the 6 Exclosure, vehicle strike and disturbance of nesting SNPL is unlikely when visitors or maintenance staff access these dumpsters. However, some large trash dumpsters near Post 2 are located within SNPL primary habitat. Although SNPL do not typically nest in this area, if a nest were established near the dumpsters, activity could crush a nest that has not been discovered by monitors or it might disturb nearby nesting and/or roosting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs could be buried by sand, depredated, or inadequately incubated, and chicks could be depredated, inadequately fed, or flushed into the open riding area. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which requires that the location of the trash dumpster near Post 2 be changed, as necessary, to avoid disturbance to any nearby active SNPL nests. Monitors will also continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found in the riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, to provide a 100-foot buffer from the nest. As a result, this effect will continue to be minimal.

Foraging and Roosting Disturbance. Trash bins are transported to and from Post 2 and the Pier Avenue entrance year-round. Transporting trash bins can affect roosting or foraging SNPL in a similar manner to the effects described for general maintenance activities (section 4.3.1.3.1) since wintering flocks of SNPL

[49] USFWS acknowledged that habitat at Oceano Dunes SVRA was already degraded at the time of listing by recreation activities, but it did not preclude the USFWS from designating it as critical habitat (USFWS 2012a).

have been observed between Post 1 and Post 2. However, the potential for vehicle strike will continue to be minimal with the implementation of the AMMs associated with the ongoing SNPL and CLTE management program as described for general maintenance activities (section 4.3.1.3.1).

Although infrequent, some garbage pick-up, including volunteer beach cleanup and cleanup of the beach after a storm, is required in the HCP area. These activities are conducted outside of the SNPL breeding season to the extent feasible. If activities occur during the breeding season (e.g., after a storm event), they are planned to avoid active SNPL nesting areas. When cleanups do occur, whether during the breeding or non-breeding season, they are typically completed on foot with handheld trash bags and can cause similar disturbance of roosting and/or foraging SNPL as general maintenance activities (section 4.3.1.3.1). To reduce any impacts from volunteer cleanup, CDPR implements the ongoing SNPL and CLTE management program, which includes ensuring all staff that conduct beach cleanups will continue to be given a training on SNPL life history and conservation measures in the HCP area. In addition, if volunteer beach cleanup occurs during the breeding season in areas where SNPL could be impacted, a permitted (or USFWS-approved) monitor is present during the activities to ensure that no impacts occur. Effects from beach cleanup are considered to be minimal with the implementation of the SNPL and CLTE management program AMMs.

Increased Predators. Trash dumpsters attract a large number of gulls that land and forage in the dumpsters if they are left uncovered (CDPR 2014a). As a result, use of uncovered trash bins within or near SNPL breeding habitat can artificially increase the number of predatory species, including gulls, and thus increase depredation of SNPL. Increasing the number of trash bins on holidays and during special events to accommodate the increased number of visitors can also artificially increase the number of predators at these times and increase depredation of SNPL. To minimize these impacts, CDPR has implemented options to limit the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. The most substantial change is using a covered dumpster with openings on the side, which has been found to attract fewer gulls than the previous open design. CDPR will also continue to implement the predator management program to ensure depredation of SNPL is minimized. The predator management program has likely contributed to the overall population (i.e., number of breeding adults) and reproductive success (i.e., number of fledglings per nesting pair) increase for SNPL in the HCP area. Curtailing predator presence near the dumpsters and limiting the movement of trash from the dumpsters will reduce the risk of predation on SNPL.

4.3.1.3.4 Wind Fencing Installation, Maintenance, and Removal (CA-23)

Nesting and Brooding Impacts. Most SNPL nest in the Exclosures and well outside of the areas where wind fencing is installed (Map 4). As a result, SNPL nests are not directly impacted by wind fence installation, maintenance, and/or removal.

SNPL will also sometimes nest outside the protection of the Exclosures. SNPL have been known to nest in the open riding area, 48-acre foredune area, vegetation islands, and near Arroyo Grande Creek. Wind fencing is located upwind of Grand Avenue, Pier Avenue, and Strand Way, which is not in areas where SNPL typically nest. Although SNPL do not typically nest in the wind fencing areas, the wind fencing is located in secondary habitat for SNPL. Therefore, installation, maintenance, and/or removal of wind fencing in these areas could result in destruction or disturbance of a SNPL nest or brood that is in the riding area and has not yet been discovered by monitors. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside of the Exclosures. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate. As a result, direct impacts to SNPL nests or chicks in wind fence installation areas are considered to be unlikely.

Vehicle Strike – Non-breeding Season. Vehicles could strike foraging or roosting SNPL during travel to install or maintain wind fencing. However, this is unlikely to occur because as part of the ongoing SNPL and CLTE management program, all staff that conduct the activities in the HCP area receive a training on SNPL and are expected to adhere to all measures implemented to protect SNPL, including a 15-mph speed limit along the shoreline.

Foraging and/or Roosting Disturbance – Non-breeding Season. Wind fencing installation, maintenance, and removal can temporarily disturb foraging or roosting SNPL during the non-breeding season; however, these activities typically require a truck to pass by non-breeding flocks of SNPL for only a brief time (i.e., no more than a few minutes). As a result, these activities have minimal if any effects of foraging or roosting non-breeding SNPL.

4.3.1.3.5 Sand Ramp and Other Vehicular Access Maintenance (CA-24)

Vehicular access maintenance activities (e.g., maintenance of parking areas, the Grand Dunes Trail, and access corridors at Oso Flaco Lake), other than sand ramp maintenance, are outside of suitable SNPL nesting, roosting, and/or foraging habitat. Therefore, these maintenance activities do not affect SNPL. The expected effects of sand ramp maintenance are described below.

Nesting and Brooding Impacts. Prior to 2014, monitoring for nesting SNPL was conducted prior to any sand ramp maintenance, which occurs in secondary SNPL habitat. During this time, no nests or SNPL individuals were observed (CDPR 2014a). In addition, given the high number of visitors in this area, it is unlikely that SNPL will attempt to nest near the sand ramps. Therefore, breeding SNPL are not likely to be affected by sand ramp maintenance. Although monitoring for nesting SNPL is not currently conducted immediately prior to sand ramp maintenance, to ensure that breeding SNPL are not affected, CDPR will continue to implement the ongoing SNPL and CLTE management program, which includes conducting surveys of the sand ramps once per day as part of the daily transects and postponing sand ramp maintenance activities if any nests are found. No impacts to nesting SNPL have been observed during sand ramp maintenance activities to date. Therefore, effects on nesting SNPL from sand ramp maintenance activities will continue to be unlikely.

Foraging and Roosting Impacts. During less busy periods in the HCP area, SNPL may roost or forage near the sand ramps. Therefore, roosting or foraging SNPL can be disturbed by sand ramp maintenance year-round. However, sand ramp maintenance activities are typically accomplished within a few hours. In addition, CDPR will continue to conduct the ongoing SNPL and management program. Therefore, to ensure that roosting or foraging SNPL are not affected, weekly surveys of the sand ramp areas will continue to be conducted as part of the routine non-breeding season monitoring for flocks of roosting birds. In addition, activities will be postponed if SNPL are observed to be present. Therefore, these activities are considered to have very minimal impacts on foraging or roosting SNPL.

4.3.1.3.6 Street Sweeping (CA-25)

Street sweeping activities do not affect SNPL since the Grand Avenue and Pier Avenue entrance stations are not located within or near SNPL breeding, foraging, or roosting habitat.

4.3.1.3.7 Routine Riparian Maintenance (CA-26)

SNPL nesting, foraging, and roosting habitat does not occur at riparian maintenance work sites; therefore, riparian maintenance at these locations does not affect this species.

4.3.1.3.8 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

Nesting and Brooding Impacts. A large portion of the SNPL breeding population in the HCP area nests within the Exclosures. Vegetation island fence and perimeter fence (Map 5) installation, maintenance, and removal does not occur within these nesting areas. As a result, the nests within the Exclosures are not directly impacted by perimeter fence installation, maintenance, and/or removal.

Perimeter fencing delineates the riding area from other areas within the HCP area. Most perimeter fencing occurs within tertiary habitat and does not affect nesting SNPL, although some limited perimeter fencing does occur within primary and secondary habitat.

Vegetation island fencing is placed around vegetation islands and occurs within primary, secondary, and tertiary habitat. SNPL are not likely to be affected by vegetation island fencing in tertiary habitat.

A limited amount of perimeter and vegetation island fencing occurs directly adjacent to the Southern Exclosure (e.g., Pipeline vegetation island). Perimeter and vegetation island fence maintenance adjacent to the Southern Exclosure can disturb nesting SNPL within the exclosure (Map 5). To reduce this impact, CDPR will continue to delay maintenance activities for the perimeter and vegetation island fence adjacent to the exclosure until late September, when all SNPL nests are confirmed to be fledged and broods are not observed to be in the area. As a result, perimeter and vegetation island fence maintenance occurring adjacent to the exclosure does not affect nesting SNPL.

SNPL also sometimes nest outside the Exclosures. SNPL typically avoid nesting in areas that are heavily vegetated (e.g., vegetation islands), although they will nest nearby such areas or in portions of vegetation islands with less vegetation such as in the early stages of restoration; therefore, SNPL infrequently nest near or within a vegetation island in primary and secondary habitat. In addition, although unlikely, SNPL can nest near perimeter fence located within primary or secondary habitat. Installation, maintenance, and/or removal of perimeter or vegetation island fencing in primary and/or secondary habitat can result in destruction or disturbance of an SNPL nest located in the open riding area or vegetation islands that has not yet been discovered by monitors. To reduce the potential impact to nests outside the Exclosures, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat in the open riding area or vegetations islands. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate. Any nests found in the vegetation islands and the 48-acre foredune area will be signed to prohibit public entry near the nests and maintenance work will be delayed in vicinity of the nests until late September, when all SNPL nests are confirmed to be fledged and broods are not observed to be in the area. In addition, any perimeter or vegetation island fence work will be delayed if SNPL are observed in the area during the breeding season. As a result, impacts to SNPL nests or chicks outside the Exclosures are considered to be very minimal.

Foraging and/or Roosting Disturbance. Perimeter and vegetation island fence installation, maintenance, and removal activities can affect SNPL when these activities are located near SNPL foraging and/or roosting habitat. Foraging and roosting SNPL can be disturbed during installation, maintenance, or removal activities because roosting and/or foraging activities are interrupted. However, maintenance activities are infrequent and short duration in areas where SNPL forage and/or roost, and birds typically move to suitable nearby foraging and roosting areas. Therefore, the effect on SNPL from these activities is considered to be very minimal.

4.3.1.3.9 Cable Fence Maintenance and Replacement (CA-28)

Nesting and Brooding Impacts. The cable fence is located on the Southern Exclosure shoreline south of Post 8 where SNPL may nest (Map 5). Cable fence replacement is conducted outside the SNPL breeding season when the area is seasonally open to the public. Therefore, replacing the cable fence does not affect breeding SNPL.

Other than possibly unburying posts at the end of the breeding season, maintenance of the cable fence is avoided during the active breeding period (i.e., late September). Any cable fence maintenance occurring during the breeding season is conducted after all nests have hatched and chicks fledged from the area. Therefore, maintaining the cable fence does not affect breeding SNPL.

Foraging and/or Roosting Disturbance. Maintenance and/or fence replacement can be disruptive to SNPL by interrupting foraging and/or roosting behavior. In addition, the noise associated with removing posts, excavating sand, and pile driving can displace foraging and/or roosting SNPL and cause increased vigilance. Although maintenance activities occur as needed during the non-breeding season, these activities are relatively short in duration (i.e., a couple of hours). Cable fence replacement occurs infrequently (i.e., every 10 to 15 years), and both maintenance and replacement activities are subject to pre-construction SNPL monitoring to minimize impacts. Finally, to further reduce the impacts associated with cable fence maintenance, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which includes conducting a training for all general maintenance staff on SNPL and observing the park regulations and rules to protect SNPL. Therefore, these activities will continue to have a very minimal effect on wintering SNPL.

Habitat Impacts. Cable fence maintenance can modify SNPL foraging habitat and deter SNPL from foraging in the area if sand is pushed out of the cable fence area into foraging habitat. This has been observed in the HCP in the past. However, additional foraging habitat is present along the HCP area shoreline, including within the protected Exclosures. As a result, this impact is considered to be very minimal.

4.3.1.3.10 Heavy Equipment Response (CA-29)

Vehicle Strike. Heavy equipment generally results in the same type of effects on SNPL as general facilities maintenance (section 4.3.1.3.1). It is sometimes necessary to use heavy equipment in SNPL primary and/or secondary habitat, including for fence maintenance and deposition for habitat enhancement, as well as for unplanned reasons, such as burying of marine mammals or moving an abandoned boat. Although SNPL nest within the Exclosures, SNPL can also nest outside the protection of the Exclosures. Heavy equipment can crush eggs or chicks in an active SNPL nest that is in the riding area and not yet identified by monitors. To reduce impacts to any SNPL nests in the riding area, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is in the riding area. In addition, any nests found in the riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of vehicle strike. In addition, all heavy equipment operators will continue to receive training that includes life history information, measures, and rules that should be implemented to protect SNPL. If heavy equipment response is needed on the closed shoreline (i.e. south of Post 6) during the breeding season, the equipment will continue to be escorted by permitted and trained monitors to ensure disturbance to roosting and nesting SNPL is minimized. Accordingly, direct impacts to nesting SNPL located in the riding area resulting from heavy equipment use are considered to be minimal.

Nesting and Brooding Disturbance. Heavy equipment activities that are conducted adjacent to the Exclosures can disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or

by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated, and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce disturbance to nesting SNPL associated with heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys will continue to be conducted in primary and/or secondary habitat prior to maintenance activities to ascertain that no active nests or broods are in the area that would be disturbed by heavy equipment activities. If SNPL are observed, activities will be delayed until an experienced monitor determines that SNPL will not be impacted. As a result, effects from activities near the Exclosures and other closed nesting areas are considered to be minimal.

Foraging and/or Roosting Impacts. Heavy equipment activities often occur within areas where SNPL do not typically forage and/or roost and thus, do not affect foraging and/or roosting SNPL. Foraging and/or roosting SNPL can be disturbed by heavy equipment activities and/or struck by heavy equipment traveling through or working within occupied foraging or roosting habitat during both the breeding and non-breeding seasons. To minimize impacts to foraging and/or roosting SNPL from heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting a training on SNPL for all heavy equipment operators and observing the park regulations and rules intended to protect SNPL (e.g., 15-mph speed limit on the portion of the beach open to the public). Heavy equipment operators traveling along the shoreline closed during the breeding season are also trained how to drive within areas where SNPL could forage or roost and are instructed to scan ahead of the vehicle for SNPL, keep speeds at or below 5 mph, and drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line). As a result, and effects from heavy equipment activities on foraging and roosting SNPL are considered to be minimal.

Heavy equipment can result in more intense disturbance to foraging and/or roosting SNPL adults and chicks if the equipment remains in an area for a prolonged period of time (e.g., when burying deceased marine life). During this time, SNPL adults and chicks can become energetically stressed by prolonged disturbance. Prolonged disturbance from heavy equipment can also reduce SNPL foraging times, and both chicks and adults can become malnourished. In addition, SNPL chicks can become separated from adults, which can leave them exposed to predators and/or inclement weather. To minimize these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which includes conducting a training for District heavy equipment operators on SNPL and observing the park regulations and rules to protect SNPL. These activities have had minimal to no effect on foraging and roosting SNPL in the past and effects on foraging and roosting SNPL are expected to continue to be minimal.

4.3.1.3.11 Minor Grading (CA-30)

The specific location and timing of minor grading activities changes from year to year. The effects of grading to maintain the seasonal exclosure fence are included in section 4.3.1.2.1, the effects of grading to maintain the perimeter and vegetation island fence are included in section 4.3.1.3.8, and the effects of grading to maintain the cable boundary fence are included in section 4.3.1.3.9.

Nesting, Brooding, and Foraging/Roosting Impacts – Breeding Season. Other minor grading is either not conducted during the SNPL breeding season or is accomplished in a manner and/or location that does not affect the species; therefore, SNPL breeding is not affected by these activities.

Foraging/Roosting Impacts – Non-Breeding Season. Minor grading during the non-breeding season can be temporarily disruptive to wintering SNPL by interrupting foraging and/or roosting behavior. In addition, the noise associated with grading activities can temporarily displace foraging and/or roosting SNPL, as well as cause increased vigilance and exposure to inclement weather and predators. However, minor grading is typically short in duration. In addition, CDPR will continue to implement the SNPL and

CLTE management program in the HCP area. Therefore, surveys for SNPL will continue to be conducted prior to initiating grading activities in any areas where SNPL are known to forage and/or roost during the non-breeding season. If any SNPL are observed close to the work area, grading will be delayed until the SNPL have left the area. Because minor grading is only conducted when SNPL are not observed near the work area, these activities have had minimal to no effect on foraging and roosting SNPL during the non-breeding season in the past. As a result, effects on foraging and roosting SNPL in the non-breeding season will continue to be very minimal.

4.3.1.3.12 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Nesting, Brooding, and Foraging/Roosting Impacts – Breeding Season. Vegetation intruding onto footpaths typically needs to be trimmed at least once a year; this is usually completed using hand tools. The boardwalk within Pismo State Beach is located in tertiary SNPL habitat. Most of the Oso Flaco Lake boardwalk is also located within tertiary SNPL habitat, although a very limited portion of the boardwalk does extend into primary habitat (see Map 6 and Map 10a). This western portion of the boardwalk in Oso Flaco is just south of the North Oso Flaco Exclosure, including a spur trail to a lookout, but the boardwalk itself ends where the path to the shoreline transitions to a sand trail. Given the distance to the shoreline, SNPL have not nested in primary habitat directly adjacent to the boardwalk in the past; therefore, work on the boardwalk is unlikely to affect nesting SNPL. In addition, boardwalk maintenance within tertiary habitat does not affect SNPL. Work on the boardwalks and other pedestrian access areas within primary habitat is conducted outside the SNPL breeding season, if possible, to avoid impacts to foraging and/or roosting SNPL. If activities are conducted during the breeding season, the associated noise and activity can displace foraging and/or roosting SNPL, as well as cause increased vigilance. However, activities associated with maintenance of access areas are short in duration. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting a training for all general maintenance staff on SNPL and observing the park regulations and rules to protect SNPL. Therefore, effects of these maintenance activities are expected to be very minimal.

Foraging/Roosting Impacts – Non-Breeding Season. Boardwalk maintenance at Pismo State Beach and some maintenance in the Oso Flaco area during the non-breeding season can be temporarily disruptive to wintering SNPL by interrupting foraging and/or roosting behavior. However, most of the boardwalk locations are outside areas where SNPL typically forage or roost during the non-breeding season. In addition, maintenance of the boardwalks and footpaths is typically conducted using hand tools, which is a less intrusive method for removing vegetation around sensitive wildlife, and work is relatively short in duration. As a result, effects on non-breeding SNPL from boardwalk maintenance are considered to be very minimal.

Heavy equipment is sometimes required to remove accumulated sand along the boardwalk, such as in the Oso Flaco area. Effects from using heavy equipment to conduct this work are similar to minor grading (section 4.3.1.3.11) and are thus considered to be very minimal.

4.3.1.4 Visitor Services

4.3.1.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

The potential threats posed by routine, non-emergency ranger and park staff patrols are similar to those described for general facilities maintenance (section 4.3.1.3.2) in that patrol vehicles drive along the beaches and dunes within posted speed limits (with the exception of emergency response [section 4.3.1.4.2]).

Vehicle Strike. Ranger and patrol vehicles are not expected to enter the Exclosures during normal, non-emergency response without having a USFWS-approved monitor escort them into the area; therefore, impacts to SNPL nesting within the Exclosures are considered to be minimal.

Lifeguard towers are not placed within habitat used by SNPL for nesting; therefore, no effects on nesting SNPL occur from lifeguard tower activity.

SNPL do nest outside the Exclosures (e.g., in the open riding area and near Arroyo Grande Creek). Ranger and patrol vehicles driving through habitat occupied by SNPL can strike individual chicks or nests that are in the riding area and not yet identified by monitors. To reduce impacts to any SNPL nests outside the Exclosures, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which includes monitors conducting daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of a vehicle striking an SNPL or crushing a nest. As a result, impacts to SNPL nests outside the Exclosures due to ranger and patrol vehicles will continue to be minimal.

Nesting and Brooding Disturbance. As with general maintenance activities, disturbance to nesting SNPL from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location, as well as the distance between most patrol activities and the Exclosures. The occasional stuck vehicle or traffic stop near a SNPL nest within the Southern Exclosure may cause disturbance to SNPL since the activity takes longer time to complete. During this time, SNPL adults may flush from nearby nests and leave eggs vulnerable to the elements/wind burial or adults with chicks can become energetically stressed by prolonged disturbance. In addition, SNPL chicks can become separated from adults, which can leave them exposed to predators and/or inclement weather. To reduce disturbance to nesting SNPL, CDPR will continue to implement the SNPL and CLTE management program, which requires a 100-foot buffer to protect SNPL nests within the HCP area, including installing bumpouts for nests within the Southern Exclosure adjacent to riding or camping areas. In addition, nests in other closed areas (e.g. vegetation islands, 48-acre foredune area) are provided with a 100-foot bumpout from the nest. The bumpouts are monitored regularly, and if an incubating bird is disturbed by vehicle activity, the buffer area is increased in size as needed. As a result, these impacts are considered to be minimal.

Foraging and/or Roosting Impacts. Non-emergency ranger and patrol vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of foraging and roosting SNPL can occur when these activities are located near occupied SNPL foraging and/or roosting habitat. In addition, vehicle strikes of foraging or roosting adults, juveniles, and/or chicks can occur if vehicles travel directly through habitat where SNPL are located during the breeding and/or non-breeding season. However, as with general maintenance activities, disturbance of SNPL from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location and the buffer between most patrol activities and the Southern Exclosure. In addition, all vehicles travel at a speed no greater than 15 mph along the riding area shoreline to reduce the risk of a vehicle striking a foraging, roosting bird. Any non-emergency vehicles traveling along the shoreline are also trained how to drive within areas where SNPL could forage or roost and instructed to drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line). Ranger vehicles have struck foraging or roosting adult SNPL during the breeding season in the HCP area in the past, including in 1998 and 2002. However, due to increased education and enforcement of regulations, including the 15-mph speed limit associated with the SNPL and CLTE management program as currently implemented in the HCP area, these impacts have been reduced. CDPR has not documented a ranger or patrol vehicle striking a foraging or roosting adult since 2002. These impacts are expected to continue to be minimal.

4.3.1.4.2 Emergency Response (CA-33)

Emergency medical and law enforcement responses by CDPR staff, which are important for maintaining human safety, can occur anywhere within the HCP area and are difficult to predict. Occasional but

necessary high-speed travel by medical and law enforcement vehicles responding to an emergency sometimes occurs in areas without frequent vehicular traffic.

Nesting and Brooding Impacts. Emergency situations are infrequent in areas where SNPL typically nest, forage, or roost during the breeding season. However, emergency vehicles must respond to human safety issues and may need to enter areas occupied by breeding SNPL.

If an emergency occurs within a Exclosure, it can be highly disruptive to SNPL as adults may flush from the nest and leave the eggs unattended for the duration of the disturbance. SNPL nests or chicks can be abandoned if the adult is injured, killed, or disturbed so that it does not return to the eggs or chick. In addition, SNPL chicks that are out in the open can be separated from adults during the disturbance, which can leave them vulnerable to predation and/or inclement weather. Disturbance can also separate broods, cause chicks to run away from the disturbance into the open riding area, and expose chicks to inclement weather. Although emergency response may occur within the Exclosures, such events are rare and do not occur in most years. Monitors also inform emergency responders of the locations of sensitive areas and escort emergency response personnel into and out of the Exclosures to minimize the potential for vehicle strike, when feasible, as part of the SNPL and CLTE management program. Monitors also attempt to survey the area once the emergency situation has been resolved and all emergency personnel are clear in order to evaluate and address any impacts that occurred. Emergency vehicles have not been documented substantially impacting SNPL within the Exclosures to date. As a result, effects on SNPL inside the Exclosures are expected to continue to be minimal.

SNPL nest outside the protection of the Exclosures (e.g., in the open riding area, near Arroyo Grande Creek). Emergency vehicles can crush eggs or chicks in an active SNPL nest that is outside the Exclosures and not yet identified by monitors. To reduce impacts to any SNPL nests outside the Exclosures, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found outside the Exclosures will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, reducing the likelihood of a vehicle striking an SNPL or crushing a nest. In addition, CDPR emergency responders are informed of the areas that are considered sensitive (e.g., Exclosures, other shoreline foraging/brooding areas), to the extent feasible, and signs are posted to mark sensitive areas. USFWS-approved monitors also escort emergency vehicles into areas that are sensitive if the situation allows for this opportunity. As a result, direct impacts to nesting SNPL outside the Exclosures due to emergency response will continue to be minimal.

Foraging and/or Roosting Impacts. SNPL foraging or roosting along the shoreline in the riding area can be struck by a speeding emergency vehicle, which can occur during the breeding or non-breeding season. If emergency vehicles must travel through areas where SNPL could forage or roost (e.g., along the shoreline), CDPR emergency responders are trained to scan ahead of the vehicle for SNPL and travel low on the shoreline to avoid most roosting birds, if time and the emergency situation allow. An emergency vehicle has only been observed striking a SNPL in flight once in 2002 and has never been observed striking a foraging or roosting SNPL in the HCP area to date; however, events may be difficult to observe. Therefore, although unlikely, it is possible that a roosting or foraging SNPL may be struck by an emergency vehicle.

Emergency response can also disturb and/or deter foraging SNPL when they drive past, and they can become malnourished if the disturbance is prolonged. However, emergency responders typically drive through an area quickly. In addition, adequate alternative foraging habitat for SNPL is present in the HCP area, including during the non-breeding season. As a result, SNPL are not typically kept from foraging due to emergency response activities.

4.3.1.4.3 Access by Non-CDPR Vehicles (CA-34)

In the past, vehicles driven by non-CDPR personnel, including law enforcement agencies, salvage personnel, and marine mammal rescue responders, may have caused unpredictable disturbances, often involving multiple vehicles and unrestricted access to the shoreline. However, the Oceano Dunes District has enacted policies requiring non-park personnel to notify park staff when access to park lands is necessary. Non-park personnel that are granted vehicular access are informed of any restricted areas or other special conditions before entering the HCP area. Except in cases of extreme emergencies, this practice has eliminated resource damage and reduced mortality, injury, and disturbance to SNPL.

Nesting and Brooding Impacts. Effects from emergencies associated with non-CDPR vehicles are similar to those effects described in section 4.3.1.4.2, but CDPR is not always able to train non-CDPR responders. Therefore, given the travel speeds sometimes necessary for emergency response, some vehicle strikes may not be avoided if the emergency requires a non-CDPR vehicle to travel through areas where SNPL are present.

Medevac helicopters are also sometimes used in the HCP area during emergencies. Medevac helicopters flying low over or landing within occupied SNPL habitat can cause substantial disturbance to nesting and/or brooding SNPL. The noise from the helicopter can be highly disruptive to SNPL and the helicopter itself could be seen as a threat. Adults may flush from the nest and leave the eggs unattended, and wind generated by the rotors may move enough sand to bury any nest in the area. SNPL nests or chicks can be abandoned if the adult is disturbed so that it does not return to the nest or chicks. Chicks can be separated from adults, leaving them vulnerable to predation and/or inclement weather; they may become separated from their brood, or they could run away from the disturbance and move into the open riding area where they become vulnerable to vehicle strike. In addition, helicopters can lead to increased vigilance in adults which can lead to them being energetically stressed or to reduced foraging. However, helicopter activity in the HCP area is a sporadic event, especially in areas where SNPL typically nest; therefore, this impact rarely (if ever) occurs. The following paragraphs detail effects from non-emergency non-CDPR vehicle activities.

Non-emergency non-CDPR vehicles do not enter the Exclosures; therefore, impacts to SNPL nesting within the Exclosures do not occur. In addition, non-emergency non-CDPR vehicles do not enter the Oso Flaco area where vehicles are prohibited; therefore, impacts to SNPL nesting within the Oso Flaco area do not occur.

Although infrequent, SNPL do nest outside the Exclosures (e.g., in the open riding area, vegetation islands, 48-acre foredune area, and near Arroyo Grande Creek). Non-emergency non-CDPR vehicles can enter some of these areas. These vehicles driving through habitat occupied by SNPL can strike individual chicks or nests that are outside the protection of the Exclosures and not yet identified by monitors. To reduce the potential impact to an SNPL nest outside the Exclosures, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found in the riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of a vehicle striking a SNPL or crushing a nest. Nests in vegetation islands will be provided a 100-foot bumpout, if appropriate, and will be signed as closed to the public. In addition, the 48-acre foredune area is closed to the public when SNPL or CLTE nests or broods are present, including the shoreline and western portion of the alleyways between the plots. Monitors will also continue to track SNPL chicks that are hatched within the riding area (i.e., within single-nest exclosures) to determine travel routes and patterns associated with foraging and exploration and either erect symbolic fencing to provide safe passage of the chicks to a non-vehicle use

area or divert vehicle traffic, as appropriate. As a result, direct impacts to nesting SNPL outside the Exclosures due to non-emergency non-CDPR vehicles will continue to be minimal.

Foraging and/or Roosting Impacts. Non-emergency non-CDPR vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of foraging and roosting SNPL during the breeding season is infrequent since SNPL do not typically forage or roost in these areas during the breeding season. However, disturbance of foraging and roosting SNPL may occur more frequently during the non-breeding season when these activities are located in or near areas where SNPL typically forage or roost. In addition, vehicle strikes of foraging or roosting adults, juveniles, and/or chicks may occur if vehicles travel directly through occupied foraging and/or roosting habitat for SNPL. To reduce the potential for vehicle strike, all vehicles travel at a speed no greater than 15 mph to reduce the risk of a vehicle striking a foraging or roosting bird. In addition, as part of the ongoing SNPL and CLTE management program, CDPR provides an education program to drivers of non-emergency non-CDPR vehicles. When possible, CDPR also has a USFWS-approved monitor escort non-emergency vehicles into otherwise closed areas to minimize disturbance to SNPL in these areas. As a result, impacts from non-emergency non-CDPR vehicles are considered to be minimal.

4.3.1.4.4 ASI Courses (ATV and RUV) (CA-35)

ASI courses occur near Worm Valley vegetation island, where SNPL are not known to nest. In addition, the ASI training area is fenced. As a result, impacts to SNPL are not known to occur from this activity.

4.3.1.4.5 Beach Concessions (CA-36)

Concession services operate throughout the open riding area. The effects of concession services, such as towing and wastewater pumping, are similar to the effects of general facilities maintenance discussed in section 4.3.1.3.1. The effects of camper rentals are similar to the effects of other campers as discussed in section 4.3.1.1.2.

Nesting and Brooding Impacts. The effects of the OHV rentals are addressed in section 4.3.1.1.1. SNPL do not typically nest between Post 2 and 2.5 where OHV rentals are located; therefore, impacts to nesting SNPL are not known to occur. However, SNPL can nest outside the Exclosures and could nest within suitable habitat between Posts 2 and 2.5, as well in locations where vehicles travel to reach the OHV rental location. Therefore, vehicles traveling to the OHV rental location could crush eggs, chicks, or adults or disturb SNPL chicks or adults in an active SNPL nest that is in the riding area and not yet identified by monitors. To reduce the potential to impact a SNPL nest or brood in the open riding area, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests and broods in potential nesting habitat that is outside these exclosures. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of a vehicle destroying or disturbing a nest. In addition, if a nest is found near the OHV rental location, a single-nest exclosure will be implemented to ensure that visitors and rental activity do not disturb the nesting birds. The buffer will continue to be increased, as necessary, until monitors observe that SNPL chicks and adults are no longer disturbed. Any SNPL broods found near the OHV rental location will be monitored and directed to a protected area, using the method described previously (see Appendix F). As a result, impacts to nesting and brooding SNPL in the riding area will continue to be minimal.

Foraging and/or Roosting Impacts – Non-Breeding Season. SNPL often roost and forage along the shoreline south of Grand Avenue, which is open to street-legal vehicles. Vehicles driving to or from concession services can strike individual SNPL. In addition, vehicles driving to and from the concession services can disturb individual SNPL in this area by flushing them from their location and causing them to

become energetically stressed. To reduce the potential to disturb or strike a foraging or roosting SNPL, as part of the ongoing SNPL and CLTE management program in the HCP area, all concession service staff receive a focused training on SNPL life history and regulations, and concession service vehicles are required to abide by park regulations and rules intended to protect SNPL (e.g., 15-mph speed limit on the portion of the beach open to the public). As a result, impacts from concessions are considered to be minimal.

4.3.1.4.6 Pismo State Beach Golf Course Operations (CA-37)

Pismo State Beach Golf Course operations do not affect SNPL since the golf course is not located within or near SNPL breeding or foraging habitat.

4.3.1.4.7 Grover Beach Lodge and Conference Center (CA-38)

Impacts to SNPL were analyzed as part of the Grover Beach Lodge EIR (SWCA Environmental Consultants 2012). Central dune scrub habitat in the Grover Beach Lodge project area was determined to have potential to support wintering SNPL, and impacts could occur during construction (Map 4). Pre-construction surveys were required to be conducted between October and February, and activities were not permitted within 500 feet of any wintering SNPL observed during the surveys. As a result, impacts to SNPL from this activity are unlikely.

4.3.1.4.8 Natural History and Interpretation Programs (CA-39)

Suitable breeding and foraging habitat for SNPL is not present at Oso Flaco Lake; therefore, natural history and interpretation programs at Oso Flaco Lake do not affect SNPL.

Trailers may be towed by CDPR staff to the beach to provide additional, impromptu, interpretive programs. These trailers are placed outside of actively used SNPL nesting, roosting, and foraging habitat. Therefore, effects on SNPL from use of the trailers do not occur.

4.3.1.5 Other HCP Covered Activities

4.3.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Nesting and Brooding Impacts. Only one SNPL nest has been observed near the Pismo Creek estuary since the implementation of SNPL monitoring in 1992 (in 2009); therefore, impacts to nesting SNPL from CDPR vehicles crossing near Pismo/Carpenter Creek are not known to occur and are not expected to occur in the future.

CDPR vehicles, driven by staff permitted by USFWS, cross Oso Flaco Creek along the shoreline and stay low on the shoreline where SNPL nests are not present. Therefore, SNPL nests in the Oso Flaco area are not expected to be impacted.

Although infrequent, SNPL have nested near Arroyo Grande Creek, which is outside the Exclosures but the upper beach near the creek and lagoon is protected with symbolic fence during the nesting season. SNPL adults and chicks also forage and roost along the shoreline outside the protection of the Exclosures, and broods may be present near Arroyo Grande Creek and Oso Flaco Creek. CDPR staff driving in Oso Flaco are escorted by monitors permitted by USFWS. In addition, staff are trained to operate a vehicle on the shoreline or other areas where SNPL may be present, including scanning ahead of the vehicle for chicks and keeping speeds at or below 15 mph in the riding area and 5 mph or less in Oso Flaco. Effects from CDPR vehicles crossing Arroyo Grande Creek in the riding area are similar to those described for general maintenance vehicles driving along the shoreline or near the Exclosures (section 4.3.1.3.1). Therefore, the effect of CDPR vehicles crossing creeks in the HCP area are considered to be minimal.

Vehicle Strike – Non-breeding Season. Non-breeding SNPL can occur in the vicinity of Arroyo Grande, Pismo, and/or Oso Flaco creeks. Effects from CDPR vehicles crossing these creeks are similar to the effects described for general maintenance vehicles (section 4.3.1.3.1) and are considered to be minimal.

4.3.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

Nesting and Brooding Impacts. Since the implementation of SNPL monitoring in 1992, only two SNPL nests have been detected near the Pismo Creek estuary (in 2009 and 2025); therefore, bridge installation, removal, and use is unlikely to affect nesting SNPL. Although SNPL rarely nest in this area (Map 11a), bridge installation and removal will need to follow AMMs, including pre-installation surveys and 100-foot minimum buffers from active nests to ensure effects on nesting SNPL are minimal. The buffer will be increased (e.g., by adding a bumpout), as necessary, until monitors observe that SNPL chicks and adults are no longer disturbed. The bridge may be temporarily closed to public use if the buffers are proving ineffective.

Foraging and/or Roosting Disturbance – Non-breeding Season. Non-breeding SNPL could occur in the vicinity of the bridge project area and could be disturbed by bridge installation and removal if foraging and/or roosting behavior is interrupted. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program during the non-breeding season, and conduct surveys prior to project activities to ensure effects on foraging and roosting SNPL are minimal. If SNPL are observed near the project area, installation and removal activities will be delayed if needed to minimize disturbance. Therefore, effects from the installation and removal of the floating bridge are anticipated to be minimal.

4.3.1.5.3 Limited Trail Riding Area (CA-42)

The limited trail riding area will be mostly located outside the Exclosures, with only a small area in East Boneyard, and within tertiary SNPL habitat (Map 8). Vehicles riding in this area are not expected to affect SNPL nests, since SNPL are not expected to nest in tertiary habitat and thus would not be affected. Similarly, SNPL typically forage and/or roost along the shoreline and not within the trail riding area; therefore, effects on foraging and roosting SNPL are not expected.

4.3.1.5.4 Replacement of the Safety and Education Center (CA-43)

Nesting and Brooding Impacts. Most SNPL nest inside the Exclosures, which is south of the safety and education center. As a result, the nests within the Exclosures are not anticipated to be impacted by replacement of the safety and education center.

SNPL will also sometimes nest outside the protection of the Exclosures. The safety and education center is located in the open riding area north of Post 5 near the Pavilion Hill island (Map 3), which is not in an area where SNPL typically nest. Although SNPL do not typically nest in this area, nests are found in the nearby 48-acre foredune area. The safety and education center is also located in primary habitat for SNPL and they could nest in this location in the future. Therefore, replacement of this facility could result in destruction or disturbance of a SNPL nest or brood that is in the open riding area and has not yet been discovered by monitors. To reduce the potential to impact a SNPL nest in the open riding area, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure, as appropriate, and a 100-foot buffer will be implemented around the nest (section 5.3.1). The buffer will be increased, as necessary, until monitors observe that SNPL chicks and adults are no longer disturbed. Nests found in the 48-acre foredune and near the safety and education center will also be provided a 100-foot buffer with additional fencing (i.e. bumpout), as necessary, to ensure activities do not disturb nesting SNPL. Therefore, impacts to SNPL nests or chicks from replacement of the safety and education center will be very minimal.

Foraging and/or Roosting Impacts. Foraging and/or roosting SNPL could be disturbed by the safety and education center replacement activities and/or struck by a vehicle working within occupied foraging or roosting habitat during both the breeding and non-breeding season. To minimize the potential for these impacts to occur, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting training for all CDPR staff on SNPL and observing the park regulations and rules to protect SNPL. In addition, surveys for SNPL will be conducted prior to conducting work and activities will be delayed until SNPL are no longer present. Workers traveling along the shoreline and within primary SNPL habitat are also trained how to drive within areas where SNPL could forage or roost and instructed to keep speeds at or below 15 mph in the riding area and scan ahead of the vehicle for SNPL. As a result, effects from safety and education center replacement activities on foraging and roosting SNPL will be very minimal.

4.3.1.5.5 Dust Control Activities (CA-44)

Numerous dust control measures are already in place in the HCP area (section 2.2.5.5) and are expected to continue during the permit term. A limited number of additional dust control measures may occur, including 1) supplemental planting within the 48-acre foredune; 2) an undetermined amount of new non-foredune vegetation planting and seasonal and/or temporary dust control measures; 3) temporary or permanent preservation of some areas of foredune vegetation in the Southern Exclosure; and 4) installing a track-out system at the Pier Avenue entrance to prevent track-out of sand onto paved, public roadways. Dust control activities on the backdunes (tertiary habitat) and Pier Avenue will not impact SNPL. A description of the impacts associated with dust control activities in primary and secondary SNPL habitat follows.

Nesting, Brooding, and/or Foraging/Roosting Impacts—Breeding Season. Most activities associated with dust control (e.g., vegetation planting and maintenance of a temporary monitoring site) will not occur within the Exclosures where SNPL typically nest (Map 25). Supplemental foredune planting and preserving vegetation within the Southern Exclosure, however, could affect nesting SNPL.

The 48-acre foredune, outside the Exclosures but within SNPL primary habitat, was fenced and closed to the public in January 2020 for air quality restoration. The area was treated with experimental planting methods in February 2020 and has developed moderate amounts of plant cover, low topography, and areas of scattered straw, which is suitable habitat for nesting SNPL. CDPR anticipates planting the area with additional vegetation subject to the outcome of the experimental planting, reviews, and approvals with the goal of allowing the area to develop foredune characteristics. Given the need to plant vegetation during the rainy season, additional plants are expected to be installed prior to March 1 and the start of the SNPL breeding season or after the season concludes in September, which will not impact nesting SNPL. Associated air quality monitoring equipment is placed in the areas and accessed on foot by CDPR staff and contractors.

The 48-acre foredune is closed to pedestrians year-round currently, but open to CDPR staff needing to maintain the vegetated areas or to access the air quality equipment. The area will be opened to pedestrians during the non-breeding season once CDPR has determined that the vegetation is adequately established. SNPL have established nests throughout the area each year since the 2020 breeding season. Nesting may decrease over time as vegetation becomes more established, but SNPL are expected to continue to nest in more open areas within and adjacent to the foredune vegetation. Because of the cryptic nature of SNPL nests and chicks, it is possible for a nest/chick to be crushed/killed or injured by dust control activities if a nest has not yet been identified by monitors. In addition, vehicle and/or pedestrian activities occurring adjacent to these areas, and pedestrian or maintenance activities within the vegetated areas, could result in disturbance of nesting SNPL, and SNPL could be deterred from incubating eggs or brooding chicks. Monitors will conduct daily searches for nests and broods in

these foredune areas. To reduce any impacts from dust control activities, CDPR will continue to implement the SNPL and CLTE management program. Surveys will continue to be conducted in the 48-acre area to ensure SNPL nests, adults, and chicks are not present near the maintenance activities, and work may be delayed until an experienced monitor determines that no impacts will occur to SNPL nests or broods. Furthermore, to limit the potential for disturbance to nesting or brooding SNPL, experienced monitors will continue accompanying CDPR staff in the field if nests are present in the 48-acre foredune area. SNPL nests found within the area but close to the fence separating it from the open riding area will be protected by a bumpout buffer a minimum of 100 feet. If the foredune area is opened to pedestrians, any nests that are found will be protected by either closing the foredune plot to the public while the nests are active, or by providing a single-nest exclosure as determined by the experienced SNPL biologist if appropriate. A buffer zone a minimum of 100 feet will also be established around all nests in areas open to recreation to ensure that recreation activities do not encroach on SNPL nests. As a result, this impact will be minimal.

Chicks that leave nests within these foredune areas are vulnerable to injury or mortality as they move from the nest area to the shoreline where they may encounter vehicles. However, the shoreline adjacent to the 48-acre foredune area will be closed to the public when SNPL nests and broods are present. In addition, CDPR will implement SNPL AMMs, as appropriate, including SNPL AMMs 1 through 30 to reduce the risk of crushing/killing or injuring a nest/chick found outside the protected foredune area. These AMMs include monitors observing known nests prior to hatching, posting signs or symbolic fencing to provide safe passage, and capturing chicks for captive rearing. As a result, these impacts will be minimal.

SNPL nesting near the fenceline of the 6 Exclosure may be disturbed by vehicles travelling between the 6 Exclosure and southern edge of the 48-acre foredune. Chronic disturbance of breeding adults from recreation activities can directly or indirectly affect chicks or eggs. Chicks or nests can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, chicks can be orphaned or inadequately nourished, and eggs could be buried by sand or not properly incubated (Warriner, et al. 1986). To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Specifically, CDPR will continue to conduct daily monitoring to enable better identification of potential threats. CDPR staff will direct traffic away from chicks moving towards the 48-acre foredune area and monitor until the brood moves safely to a non-vehicle use area. A temporary fence corridor will be installed, as necessary, to allow safe passage of chicks. In addition, a nest avoidance buffer of a minimum of 100 feet will be used to protect SNPL nests near the fenceline of the 6 Exclosure. The buffer or chick corridor will be increased in size, as necessary, until monitors observe that SNPL adults and chicks are no longer disturbed. As a result, disturbance to nesting or brooding SNPL associated with recreation will be minimized.

The multi-strand metal fencing used for these foredune areas is similar to fences placed at other vegetation islands. Fences placed in otherwise open habitat can be hazardous to flying birds. SNPL nesting or foraging within these areas may be at risk of striking the foredune fencing. However, SNPL have not been documented striking other vegetation island fencing and, although they have been documented striking the seasonal exclosure fence and symbolic fence at Oso Flaco, such events have been rare and happened only a few times from 2002 to 2023. In addition, CDPR will implement SNPL AMMs (Table 5-2), as necessary, to minimize the risk of fence strike. As a result, SNPL are very unlikely to strike the fencing, and this impact is expected to be minimal.

SNPL chicks and adults/juveniles have been observed leaving the protection of the Exclosures and entering the open riding area where they are at risk of being struck by a vehicle. Establishing a foredune or vegetation island in an area open to motorized recreation exacerbates this issue since it limits the open sand areas for motorized recreation to occur, especially along the shoreline where SNPL chicks are

brooded and/or adults and chicks are foraging. Vehicle alleyways in the foredune areas allow vehicles to travel between the foredune plots, which could impact SNPL that may also utilize the pathways for travel to the shoreline. As a result, more SNPL will be vulnerable to vehicle strike due to the presence of vehicles on the shoreline. Chicks will be most vulnerable since they will be unable to fly out of harm's way. This could be exacerbated in conjunction with the Southern Exclosure reduction (section 2.2.5.11), which is predicted to result in some adult aggression/density issues and push additional chicks and adults out of the protection of the exclosure into the open riding area. In addition, nests established in the foredune areas will be at risk if they hatch and chicks leave the foredune and travel along motorized recreation trails in order to reach the shoreline to forage. CDPR will close the shoreline adjacent to the foredunes and the western portion of the vehicle alleyways to public access using wire or symbolic fencing when nests and broods are present in the foredune area. The closed shoreline will connect and be contiguous with the 6 Exclosure shoreline. In addition, some eggs and chicks may need to be captured and brought to a captive rearing facility to prevent mortality and injury (AMM 22). With these measures, the risk of vehicle strike along the shoreline or within the alleyways is unlikely.

Temporarily or permanently protecting foredune vegetation within the Southern Exclosure, as opposed to seasonal closure, could reduce the open habitat preferred by nesting SNPL and thereby reduce productivity. This potential for reduced habitat is discussed below. Installing and maintaining closure fencing would not affect breeding SNPL in addition to the effects described in section 4.3.1.2.1 (CA-12a).

Foraging/Roosting Impacts—Non-Breeding Season. Foredune and Southern Exclosure fencing and vegetation installation in the 48-acre foredune could disturb foraging and/or roosting wintering SNPL by displacing them from suitable foraging and/or roosting habitat during the disturbance and or deterring them from foraging and/or roosting during the disturbance. CDPR will conduct pre-construction surveys for SNPL prior to starting work and delay activity until SNPL are no longer present (SNPL AMM 103). As a result, potential impacts to SNPL from these activities will be minimal.

SNPL are present and vulnerable to vehicle strike or disturbance during the non-breeding season. As noted in section 3.3.1.4.2, foraging and roosting wintering SNPL are frequently located in various areas of the park, and SNPL may roost or forage along the shoreline of the 48-acre foredune area. Fencing off the foredunes removes some shoreline area that can be utilized for both visitor driving and SNPL foraging. As a result, SNPL could be more vulnerable to vehicle strike due to the reduced area along the shoreline. Additionally, depending on its size and location, fencing to temporarily or permanently preserve Southern Exclosure vegetation could create an increased risk of vehicle strike. To reduce this impact, CDPR will implement the SNPL and CLTE management program in these areas, which includes weekly monitoring for wintering SNPL in the HCP area to locate foraging and/or roosting birds, enforcement of the posted speed limits, placing additional speed limit or protected wildlife signs near foraging and/or roosting flocks, and implementing public education methods (e.g., handing out brochures, posting signs). Implementation of the SNPL and CLTE management program will reduce the impacts to wintering SNPL from motorized recreation.

Reduced Habitat. Foredune vegetation installed within SNPL primary habitat and temporary or permanent preservation of some areas of foredune vegetation in the Southern Exclosure will reduce available suitable SNPL breeding and/or wintering habitat by decreasing the amount of open, wide shoreline, beach, and sparsely vegetated foredunes. Any additional vegetation associated with dust control activities within SNPL secondary habitat will further reduce the quality of such habitat and ultimately potentially convert it into tertiary habitat (e.g., vegetated dune; see section 3.3.1.8). Previous studies have found that SNPL select habitats that are open (or wide) and have less vegetative cover in order to facilitate early detection of predators and reduce predation risk (Muir and Colwell 2010, Brindock and Colwell 2011, Patrick and Colwell 2014). Reducing SNPL habitat by planting vegetation in suitable primary and secondary SNPL habitat or allowing denser vegetation to develop in the Southern

Exclosure could lead to less open (or wide), sparsely vegetated beaches and steeper hummocks, reducing nesting initiation and success and potentially increasing predation on adults, chicks, and/or eggs if SNPL are not able to detect predators moving towards the nest location. CDPR will implement all AMMs (Table 5-2), as appropriate, to reduce impacts from dust control activities, including managing habitat in the Southern Exclosure to ensure it retains the necessary physical and biological characteristics of primary habitat as defined section 3.3.1.8 and indicated by breeding productivity. In addition, CDPR implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. With these measures, impacts are expected to be reduced.

Increased Predators. Vegetation planted for dust control, especially vegetation planted within primary or secondary habitat, and denser vegetation and steep hummocks allowed to develop within the Southern Exclosure, may impact breeding SNPL by providing habitat for mammalian predators to hide and stalk nesting, foraging, and/or roosting SNPL. In addition, the wire fence surrounding the vegetation areas (e.g., 48-acre foredune) is the same type as vegetation island fence and does not keep coyotes or other predators out of the area. CDPR will implement all AMMs (Table 5-2), as appropriate, to reduce impacts from dust control activities. These measures will include erecting single-nest or mini exclosures as needed around any SNPL nests that occur within the fenced vegetation areas. Furthermore, CDPR's predator management program has been successful at controlling predators in the HCP area and protecting breeding SNPL. The predator management program has likely increased reproductive success for SNPL and is expected to alleviate any impacts associated with additional vegetation being planted near SNPL habitat. CDPR reviews the predator management plan as needed in coordination with USFWS and may update the plan to identify additional appropriate measures in response to new predators or concerns. As a result, these effects are anticipated to be minimal.

4.3.1.5.6 Cultural Resources Management (CA-45)

Cultural resource management activities are generally conducted outside areas where SNPL are typically observed or outside the SNPL breeding season and do not affect SNPL. In the unlikely event that cultural resource management activities must occur in the future during the breeding season in areas where SNPL typically nest, these activities could disturb and/or displace SNPL from roosting or nesting. In addition, cultural resource management activities could disturb and/or displace SNPL from roosting or foraging during the non-breeding season. To reduce any impacts from cultural resource management activities, CDPR will continue to implement the SNPL and CLTE management program. Therefore, surveys will continue to be conducted in areas where SNPL could occur to ensure SNPL nests, adults, and chicks are not present within and near the cultural resource management area, and activities will be delayed until an experienced monitor determines that no impacts will occur if a SNPL is observed during the surveys. Furthermore, to limit the potential for disturbance to nesting SNPL, environmental monitors will continue accompanying archaeologists in the field when cultural resources protection work must occur within or adjacent to areas where SNPL are known to nest. Therefore, the effects from cultural resource management are considered very minimal and will continue to be minimal in the future.

4.3.1.5.7 CDPR Management of Agricultural Lands (CA-46)

Management activities conducted on agricultural lands do not affect SNPL since agricultural lands are not SNPL breeding or foraging habitat.

4.3.1.5.8 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

Maintenance of a bioreactor on agricultural lands does not affect SNPL since the agricultural lands are not SNPL breeding or foraging habitat.

4.3.1.5.9 Oso Flaco Lake Boardwalk Replacement (CA-48)

Suitable nesting, foraging, and/or roosting habitat for SNPL is not present at Oso Flaco Lake; therefore, Oso Flaco boardwalk replacement is not expected to affect this species.

4.3.1.5.10 Special Projects (CA-49)

Nesting and Brooding Impacts. Special projects include activities required to meet a facility's need, such as installing vault toilets and could not occur in vegetation islands or aquatic habitat (section 2.2.5.10). Though the actual location of special projects is not yet known, this HCP anticipates that special projects could directly affect up to 35 acres of 4,154 acres of available SNPL habitat over the permit term, although less than 950 acres are within primary and/or secondary habitat (i.e., 698 acres in primary habitat and 250 acres in secondary habitat) where SNPL may nest. Special projects within tertiary habitat are not expected to affect SNPL since SNPL rarely occur within tertiary habitat. Special projects in primary and secondary habitat will be conducted outside the SNPL breeding season, to the extent feasible. If special projects in primary and secondary habitat are conducted in the breeding season, they will not be conducted within the Exclosures where the majority of SNPL nest; therefore, SNPL nesting will not be affected by special projects.

Although most SNPL nest within the Exclosures, SNPL also occasionally nest outside the protection of the Exclosures, including in the open riding area, vegetation islands, 48-acre foredune area, and near Arroyo Grande Creek. Construction activities and vehicles associated with special project construction could crush eggs, chicks, or adults or disturb SNPL chicks or adults in an active SNPL nest that is in the riding area and not yet identified by monitors. To reduce impacts to SNPL nests that could occur in the riding area, CDPR will continue to implement the SNPL and CLTE management program. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. In addition, any nests found in the open riding area are quickly protected with symbolic or wire fencing and a large single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of construction activities destroying or disturbing a nest. Furthermore, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until SNPL are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project that could impact SNPL. As a result, special projects are not expected to affect nesting SNPL.

Foraging and/or Roosting Impacts. Foraging and/or roosting SNPL may be disturbed during special project activities because roosting and/or foraging activities could be interrupted. However, 3,130 acres of the 4,154 acres of SNPL habitat where special projects could occur are located in tertiary habitat where SNPL are not expected to forage and/or roost. Special project activities in primary and secondary habitat are expected to be infrequent and of short duration. In addition, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until SNPL are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project in areas that could impact SNPL (e.g., primary and secondary habitat). As a result, special projects are not expected to affect foraging and/or roosting SNPL.

Reduced Habitat. Placing special projects within SNPL primary and secondary breeding habitat reduces the amount of habitat available to SNPL for breeding by precluding them from nesting within the footprint of the structures. However, many special projects will not be placed within primary and/or secondary habitat. In addition, special projects are small (i.e., not to exceed 35 acres over the permit term), and they are placed in areas where SNPL do not typically nest (e.g., outside the Exclosures). In addition, special project plans within areas that could impact SNPL will be submitted to the USFWS for review and approval prior to construction. Therefore, this effect will be minimal.

4.3.1.5.11 Reduction of the Boneyard and 6 Exclosures (CA-50)

Reduction of the Boneyard and 6 Exclosures is not expected to result in additional impacts to adult and/or juvenile SNPL beyond those described above for motorized recreation (section 4.3.1.1.1) and pedestrian activities (section 4.3.1.1.3) since SNPL AMMs would be implemented, as appropriate, including installing large single-nest exclosures around any SNPL nest within the open riding area and installing bumpouts for nests in the remaining Southern Exclosure within 100 feet of the open riding area. The Southern Exclosure will be enlarged, when necessary, to encompass nests in the open riding area close to the existing fence boundary, and a large exclosure will be provided to surround two or more nests within 200 feet of each other in the open riding area. In addition, SNPL broods will be provided temporary fencing until they move to a protected area, and additional fencing will be installed as necessary to protect broods.

Eliminating the East Boneyard Exclosure (approximately 47 acres) and incremental elimination of 6 Exclosure (62 acres)[50] could result in the loss of up to 109 acres of protected SNPL breeding habitat. This reduction represents approximately one-third of the 368 acres of SNPL breeding habitat currently protected by the Exclosures (300 acres in the Southern Exclosure and 68 acres in North Oso Flaco Exclosure).

Although the East Boneyard Exclosure is considered suitable habitat for SNPL, it has supported only 11 SNPL nests since 2005, and none since 2019, indicating that this area may not provide ideal nesting habitat for SNPL. Any nest that was established in this area once the East Boneyard Exclosure is removed would be protected by a single-nest exclosure, and a 100-foot buffer would be implemented. SNPL are known to nest within the West Boneyard Exclosure, and the East Boneyard Exclosure has provided a buffer from any recreational disturbance in the open riding area. Removal of the East Boneyard Exclosure would thus result in motorized recreation activities adjacent to the West Boneyard Exclosure where SNPL could nest. However, if any SNPL within the West Boneyard Exclosure are observed to be disturbed by increased recreation and/or new travel patterns within the former adjacent East Boneyard Exclosure, a bumpout will be installed to ensure that disturbance in this area is minimized. As a result, impacts to SNPL from removal of the East Boneyard Exclosure will be minimal.

Public access between Oso Flaco and East Boneyard is allowed via a gate (Boneyard gate), but this access is currently inaccessible during the SNPL breeding season since it is enclosed within the southern end of East Boneyard Exclosure. If the East Boneyard Exclosure is removed, then recreationists could once again access the Boneyard gate during the breeding season for pedestrian access to the Oso Flaco area. SNPL frequently nest in the Oso Flaco area, and any SNPL that nest within South Oso Flaco could be disturbed by recreationists that enter South Oso Flaco through the Boneyard gate. However, the Boneyard gate would be moved, as necessary, to ensure that recreational access to South Oso Flaco from the former East Boneyard area would continue to be limited. As a result, this impact will be minimal.

The 6 Exclosure has had greater nesting success and is one of the higher producing exclosure areas. From 2005 to 2023, between 25 and 97 of known location SNPL nests (i.e., 24 to 46 percent of the total SNPL nests in the HCP area) have been established in the 6 Exclosure annually. Therefore, reduction of the 6 Exclosure could expose nesting, foraging, and/or roosting SNPL to recreation and other activities.

[50] CDPR may reduce the exclosure via other configurations, such as east to west. However, the north-to-south configuration is anticipated to be the most impactful scenario to SNPL due to the simultaneous loss of nesting and foraging habitat. Therefore, for purposes of analysis this section focuses on the worst-case scenario (i.e., a north-to-south, 328-foot or approximately 7.5-acre reduction).

Individuals not protected by the exclosure fence could be killed, injured, or disturbed if activities occur close by. Based on historical data in the HCP area from 2005 to 2023, the most nests established in the first 328 feet[51] of the 6 Exclosure in a year has been nine nests. As a result, although unlikely,[52] it is possible that up to nine nests could be exposed to recreation and other activities during the first incremental decrease of the 6 Exclosure if SNPL do not move south into the remaining protected area. Ultimately, although unlikely, if the entire 6 Exclosure is removed, between 25 and 97 nests could be exposed to recreation. In addition, as the SNPL population increases, it is possible that more SNPL breeding activity would occur in the open riding area. Since these nests each require a minimum 100-foot radius buffer (0.72 acres), there could temporarily be less riding area available overall while the single-nest exclosures are in place.

From 2011 to 2023, the average density of concurrently active SNPL nests within the 6 Exclosure ranged from 0.34 to 0.79 nests/acre. This does not include concurrently active CLTE nests, which form a tighter colony interspersed with SNPL nests. Although adult territorial aggression towards SNPL chicks mostly occurs along the shoreline of the Exclosures where broods are raised, the behavior has been observed within the seasonal exclosure (i.e. area of Exclosures with predator fencing) when chicks from one brood move into the territory of another brood/nest. Adult aggression toward chicks can injure or kill the chicks or expose them to inclement weather, starvation, and/or predation. Currently, territorial aggression in the seasonal exclosure east of the shoreline is only occasionally observed. However, reduction of the 6 Exclosure could exacerbate the territorial aggression within the seasonal exclosure by reducing the amount of habitat available for nesting so that nests must be established in closer proximity, and chicks will be more likely to enter the territory of another brood. In addition, as the SNPL population increases, it is possible that more SNPL breeding activity may move into the open riding area. The maximum number of SNPL nests during one breeding season within 1 acre in the 6 Exclosure from 2005 to 2018 did not exceed seven nests, and some portion of these nests was established during the same time period. Therefore, this suggests that the maximum density for SNPL nests within an acre is seven nests. If the 6 Exclosure is reduced by 328 feet in a breeding season, SNPL that previously nested in that portion of the exclosure are expected to move into the remaining protected area (Lafferty, Goodman and Sandoval 2006), which would contract the SNPL nest distribution and increase the density of nests in the remaining exclosure area. Ideally, habitat would be available for SNPL to continue to nest at a favorable density; however, it is estimated that in a worst-case scenario, nest density within a breeding season could exceed the maximum density in some areas of the exclosure by at least one nest in the first 328-foot exclosure reduction. This trend would continue if the exclosure continued to be reduced by 328 feet or approximately 7.5 acres each breeding season.

Adult territorial aggression towards SNPL chicks has been observed along the shoreline when foraging chicks move into the territory of another brood. Adult aggression toward chicks on the shoreline can injure or kill chicks and/or separate them from the attending adult. In addition, adult aggression can result in chicks along the Southern Exclosure shoreline leaving the protection of the exclosure and entering the open riding area where they are at risk of being struck by a vehicle. Reduction of the 6 Exclosure (especially if the exclosure is reduced from north to south) would exacerbate this territorial aggression issue by reducing the amount of protected shoreline habitat available for foraging so that

[51] CDPR may reduce the exclosure via other configurations, such as east to west, but for purposes of analysis this section focuses on a north-to-south, 328-foot (approximately 7.5 acre) reduction.

[52] Most SNPL are expected to move south into the protection of the exclosure to avoid disturbance from recreation activity. This has been observed at Coal Oil Point Reserve (Lafferty, Goodman and Sandoval 2006) where SNPL increased in abundance and contracted their distribution to within the protected area to avoid recreation disturbance.

broods would either forage in closer proximity to another brood or leave the protection of the Southern Exclosure to avoid entering the territory of another brood. Historical nest data indicates that between 25 and 97 nests have been established annually in the 6 Exclosure between 2005 and 2023; therefore, if the entire 6 Exclosure is removed, it could result in 75 to 291 chicks moving into the open riding area to forage where they are at risk of being struck by a vehicle.

To ensure that SNPL nesting levels in the HCP area continue to contribute to the overall success of the population, the HCP ensures that the 6 Exclosure will not be reduced unless specific criteria are met, including obtaining a breeding population size greater than 180 SNPL for 3 consecutive years and a fledge rate of 1.0 fledgling per breeding male over the same period (section 5.2.3). Any nests found outside the reduced area of 6 Exclosure in the open riding area will be protected by a single-nest exclosure to provide a minimum 100-foot buffer, thus reducing the likelihood of direct impacts to nesting SNPL. The existing Southern Exclosure will be enlarged to encompass nests close to the existing fence boundary (e.g. approximately 150 feet away) and a large exclosure with be provided to surround two or more nests within 200 feet of each other in the open riding area (if topography allows and is safe public traffic patterns are available). In addition, bumpouts would be installed as necessary to reduce disturbance to SNPL nesting near the areas open to motorized recreation. Fencing for such all such exclosures will continue to be maintained a minimum distance of 100 feet from the nest site.

Monitors will track SNPL chicks that are hatched within single-nest exclosures and other temporary exclosures in the riding area to determine travel routes and patterns associated with foraging and exploration and CDPR would determine the appropriate method to protect broods. Chicks hatching from a single nest may be protected with symbolic or wire fencing to keep vehicles away, fencing would be installed prior to the nest hatching, and fencing would remain in place until chicks moved to a protected area. In addition, the shoreline component adjacent to (west of) nests hatching in reduced areas of 6 Exclosure may be temporarily closed to the public if determined by CDPR to be necessary to allow broods to safely move to the adjacent shoreline for foraging and rearing habitat. The closure will be contiguous with the remaining Exclosure shoreline and fencing will be removed once all chicks on the opened 6 Exclosure shoreline have fledged or moved out of the area.

Although these measures will reduce impacts to SNPL eggs and chicks in the riding area, some eggs and chicks may still need to be captured and brought to a captive rearing facility to prevent mortality and injury (AMM 22). With these measures the reduction of East Boneyard and 6 Exclosures are expected to be minimized. In addition, the criteria will ensure that a viable population of SNPL continues to breed within the HCP area.

4.3.1.5.12 Use of Pesticides (CA-51)

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, potential for indirect effects exists in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species. Moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general. Any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Indirect exposure of pesticides on birds, fish, or amphibians can occur when they eat contaminated prey or vegetation. Direct exposure can occur when birds, fish, or s contact pesticide residues with their skin or eyes or when they inhale vapors or particulates. Expected effects from each pesticide are described in more detail below.

Nesting or Brooding Impacts. Insecticides are not applied during the SNPL breeding season. Therefore, insecticides do not affect breeding SNPL.

Herbicides are used during the SNPL breeding season; however, they are not used in areas known to be occupied by SNPL. SNPL can be impacted by drift from herbicides sprayed outside of but nearby known breeding areas. In addition, SNPL outside of known breeding areas that have not yet been discovered by monitors can be impacted by herbicides as described below for foraging and/or roosting impacts during the non-breeding season. AMMs listed in Table 5-2 will reduce or eliminate these impacts.

Aerial spraying of herbicides has the potential to flush SNPL. However, aerial spraying is conducted in the backdunes, which is outside areas where SNPL nest, forage, or roost. As a result, SNPL are not impacted by aerial spraying activities.

Foraging and/or Roosting Impacts – Non-breeding Season. A general description of the location where each pesticide is used in the HCP area in relation to SNPL habitat and the anticipated effects of each pesticide on SNPL follows.

Glyphosate is sometimes used in suitable SNPL habitat (i.e., foredunes) to control European beach grass and Russian wheat grass. Numerous scientific and regulatory reviews have examined the potential direct effects of glyphosate on a wide variety of wildlife species including birds. Such reviews consistently conclude that the use of glyphosate products in accordance with product labels does not pose a significant risk of either direct acute or chronic toxicity to terrestrial wildlife species (EPA 1993, Giesy, Dobson and Solomon 2000, Tatum 2004, SERA 2011a, Pest Management Regulatory Agency 2015). The detailed risk assessment conducted by Syracuse Environmental Research Associates (SERA 2011a) calculated the risk of glyphosate to small mammals and birds based on the relationship between estimated exposure (e.g., via direct overspray or through consumption of contaminated vegetation, water, insects, or fish) following application of glyphosate-based herbicides and considered both acute and chronic (i.e., longer-term exposures). In summary, the author stated that congruent with the U.S. Environmental Protection Agency (EPA) (1993) assessment, “none of the hazard quotients for acute or chronic scenarios reach a level of concern even at the upper ranges of exposure.” EPA completed a biological evaluation for glyphosate and determined glyphosate is likely to adversely affect SNPL (EPA 2021a). Future consultation between EPA and USFWS may result in additional mitigation measures for glyphosate use (EPA 2021b), which may or may not be applicable to the HCP area.

Fluazifop-p-butyl is typically used in the backdunes to control perennial veldt grass, which is outside areas where SNPL typically nest, forage, and/or roost. In addition, fluazifop-p-butyl is considered practically non-toxic (Class 0) to avian species (White 2007).

Imazapyr is sometimes used in suitable SNPL habitat (i.e., foredunes) to control European beach grass and Russian wheat grass. The available avian studies on imazapyr, all of which were conducted up to limit doses, do not report any signs of toxicity (SERA 2011b).

Triclopyr is typically used to control Cape ivy, which mostly occurs in riparian areas outside areas where SNPL typically nest, forage, and/or roost. In addition, triclopyr acid is considered practically non-toxic (Class 0) to slightly toxic (Class 1) to birds (White 2007).

Aminocyclopyrachlor is typically used to control iceplant, which sometimes occurs in suitable SNPL habitat (i.e., foredunes). The EPA/Office of Pesticide Programs (2010) classifies aminocyclopyrachlor as practically non-toxic (Class 0) or only slightly toxic (Class 1) to mammals, birds, fish, and aquatic invertebrates (SERA 2012).

Chlorsulfuron is typically used to control ice plant, which sometimes occurs in suitable SNPL habitat (i.e., foredunes). The EPA pesticide registration process requires toxicological data be supplied to evaluate

avian tolerance to chlorsulfuron. Data from the available literature indicate that chlorsulfuron has low toxicity to birds. Acute dietary exposure did not result in toxic effects at 5,000 parts per million (ppm), (equivalent to 500 milligrams (mg)/kg bodyweight-day (BW-day) in mallards [*Anas platyrhynchos*]) and at 5,620 ppm (equivalent to 3,394 mg/kg BW-day in bobwhite quail [*Colinus virginianus*]) using technical grade chlorsulfuron (ENSR International 2005). CDPR's current application rates and use patterns for chlorsulfuron pose a negligible risk to wildlife.

Aminopyralid is typically used to control Cape ivy, which mostly occurs in riparian areas outside areas where SNPL typically nest, forage, and/or roost. In addition, in Dow AgroSciences laboratory testing, aminopyralid has been shown to be "practically non-toxic" (Class 0) to birds, fish, honeybees, earthworms, and aquatic invertebrates (EPA 2005, DOW Chemical Company AgroSciences 2008).

Sethoxydim is slightly toxic to birds (SERA 2001); however, it is used in the backdunes to control perennial veldt grass, which is outside areas where SNPL typically nest, forage, and/or roost.

Clethodim is used in the backdunes to control perennial veldt grass, which is outside areas where SNPL typically nest, forage, and/or roost. In addition, clethodim is practically non-toxic to birds and is unlikely to pose a hazard to avian species (SERA 2014).

Vector control is not directly applied in suitable SNPL habitat. In addition, VectoBac G is toxic only to the larvae of certain diptera; it does not harm other aquatic, marine, or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®. Competitor® is a surfactant labeled for aquatic use, with either imazapyr or glyphosate. Little information is available regarding the potential effects of Competitor® on SNPL; however, the product safety data sheet states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a). Renegade EA® is a surfactant labeled for aquatic use that is made of methylated seed oil, UAN solution, and nonionic surfactant. Little information is available regarding the potential effects of Renegade EA® on SNPL; however, the product safety data sheet also states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016b).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area results in overall beneficial effects to covered species by removing invasive species in the area. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to SNPL decrease with increasing distance from the treated field or site of application. CDPR takes extra precautions applying pesticides near sensitive habitats that support SNPL. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Table 5-2 will reduce or eliminate these impacts.

4.3.1.5.13 CDPR UAS Use for Park Activities (CA-52)

Nesting and Brooding Disturbance. CDPR will avoid flying UAS in areas where breeding SNPL will be affected, if possible. However, CDPR may use UAS in or near SNPL nesting or brood rearing habitat during the breeding season for some activities (e.g., predator management, habitat enhancement, SNPL monitoring, or public safety/law enforcement purposes). In 2018, prior to the SNPL breeding season, CDPR staff assessed the ability of a UAS to capture the amount of wrack present on the shoreline within SNPL breeding habitat. The UAS was tested over a period of a week and found to be highly effective at

assessing nesting habitat enhancements distributed by staff. During the UAS flight, CDPR observed a small flock of SNPL and other shorebirds nearby. The flock of SNPL and other shorebirds did not flush or crouch in response to the UAS, and monitors observed SNPL to be unharmed. Reactions to UAS can vary greatly among bird species and even among species within the same family, such as gulls and terns (Barr, et al. 2020). At least one species of tern has been shown to readily habituate to UAS (Chabot, Cralk and Bird 2015), suggesting the potential exists to use UAS among colonial nesting species such as CLTE without significant disturbance. In addition, AMMs (Table 5-3) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, initiating flights at least 330 feet from the closest known nest location, following existing monitoring guidelines that have been established by USFWS, having a trained biologist scan the area for roosting and nesting SNPL before every flight, having a trained biologist monitor during the flight if SNPL are observed, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, and flying UAS at least 100 feet above ground at all times and moving UAS to higher altitude or aborting the mission if UAS are observed disturbing nests or broods. Certain public safety UAS uses, such as search and rescue, may prevent implementing all such measures, but such incidents are not common, and all UAS operators will receive training to minimize effects on SNPL as much as possible, with additional training for law enforcement UAS operators to minimize disturbance to SNPL even during emergencies. As a result, UAS are expected to have minimal impacts on nesting and/or brooding SNPL during the breeding season, although some disturbance may occur depending on the protocol necessary for the specific data gathering or the location and nature of the emergency response. Overall, UAS will collect valuable information on SNPL habitat, predators, and breeding that will inform future management decisions within the HCP area, and law enforcement flights will improve public safety given the aerial vantage point.

Foraging and/or Roosting Disturbance – Breeding and Non-breeding Season. UAS may be used during the non-breeding season throughout the HCP area and during the breeding season outside occupied SNPL breeding habitat and could disturb roosting and/or foraging SNPL. However, Vas et al. (2015) assessed reactions by a variety of waterbirds to approaches by UAS and found that the birds remained unaffected in most cases, suggesting the potential to use UAS without significant disturbance. In addition, AMMs (Table 5-3) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, scanning the area for roosting or foraging SNPL prior to every flight, flying UAS at least 100 feet above ground, and ensuring all non-emergency flights are approved by Natural Resource staff. As a result, UAS are expected to have minimal impacts on foraging and/or roosting SNPL during the non-breeding season and/or outside occupied SNPL breeding habitat during the breeding season.

4.3.2 Anticipated Take of Western Snowy Plover

This section quantifies the potential for incidental take of SNPL due to the effects described in the preceding section. Given that both covered activities and the conservation program described in this HCP are largely ongoing, incidental take estimates are based primarily on past take data, with the exception of the take associated with future Southern Exclosure reduction (CA-50) and newly implemented dust control activities (CA-44). The incidental take numbers presented in this HCP account for worst-case past observations of mortality and injury that have been observed only rarely during the timeframe from 2002 to 2023 and do not happen most years. Oceano Dunes District will continue to manage for breeding SNPL targets. The estimates recognize that not every egg or individual SNPL may be detected. These data have resulted from long-term, intensive monitoring within the HCP area. A similar level of future take is expected to occur if CDPR maintains a similar set of conditions for the SNPL population within the HCP area in the future. One new form of incidental take that does not currently occur within the HCP area – egg and chick capture for captive rearing if determined to be threatened by

covered activities (AMM 22 in CA-12b) – has been added to this HCP. The take numbers thus include 12 eggs (i.e., 4 nests) and 12 chicks (i.e., 4 broods) that could be captured for captive rearing or crushed/killed due to existing and new covered activities.

The following sections estimate incidental take of SNPL based on the effects analyses (section 4.3.1). The effects analyses provide a complete discussion of all aspects of covered activities that could possibly impact the covered species. However, not every effect on a covered species rises to the level of take.

This HCP quantifies lethal take, capture, and harm of SNPL within the HCP area in terms of:

- Take of individual SNPL adults, juveniles, chicks, and eggs caused by park operations, recreation, and other activities not related to covered species management.
- Take of SNPL caused by covered species management-related activities that are specifically implemented to protect nests and individuals from public activity (i.e., fencing, single nest exclosures). Impacts from management activities related to monitoring and protecting SNPL (recovery activities) are referenced in Appendix C and will be authorized under the 10(a)(1)(A), Recovery Permit (TE-815214-10).

The estimated incidental take of SNPL is summarized in Table 4-3 and discussed in detail below. Lethal take and harm to SNPL due to park operation, recreation, and natural resources management-related activities not related to Recovery Permit actions is largely avoided due to the implementation of AMMs. However, despite AMM implementation, some harm or lethal take may still occur.

4.3.2.1 Take of SNPL Adults, Juveniles, Chicks, and Eggs from Park Operations, Recreation, and Other Activities Not Related to Recovery Activities

This section provides an estimate of SNPL take that could occur during covered activities and specific management activities designed to protect SNPL and nests from incidental take. Take estimates are generally based on worst-case past observations of SNPL in the HCP area. All take estimates also account for the conservation program measures and AMMs since the conservation program is an ongoing practice in the HCP area. Table 4-3 summarizes the estimates for take of SNPL adults, juveniles, chicks, and eggs due to covered activities not specific to recovery activities covered under Recovery Permit TE-815214-10 (referred to as “non-recovery” activities/actions).

4.3.2.1.1 Take of Adults and Juveniles

Take of adult and juvenile SNPL may occur during both the breeding and non-breeding seasons. CDPR dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program. As a result, take that could otherwise occur is minimized.

Take of adult and juvenile SNPL is most likely to occur from motorized vehicle recreation (section 4.3.1.1.1), covered species management (section 4.3.1.2.1), and park operations (sections 4.3.1.3 through 4.3.1.5), although some take may occur due to non-motorized vehicle recreation (sections 4.3.1.1.2 through 4.3.1.1.9). Many SNPL nest within the Exclosures and are thus protected from vehicles and other motorized and non-motorized activities. Many SNPL also nest within the Oso Flaco area, where vehicles are prohibited and either predator or symbolic fencing is erected to protect breeding birds and minimize impacts from other activities. However, some SNPL will nest in areas closed for dust control, and SNPL will occasionally nest outside the Exclosures in areas open to vehicles and other activities. Park staff monitor areas outside the Exclosures daily, looking for SNPL and signs that they may be nesting outside the Exclosures. Nests found in the open riding area are protected within a single-nest exclosure (section 2.2.2.1.1), as appropriate. However, although the majority of the nests outside the Exclosures are likely found, due to their cryptic nature, some nests could go undetected, and adults sitting on the nest or protecting the nest could be killed or injured from collisions with motorized

vehicles. SNPL may also forage and roost outside the Exclosures along the shoreline that is open to vehicles or within the open riding area, where they are at risk of being struck or disturbed by a vehicle. SNPL adults or juveniles can strike exclosure or other fencing while flying.

SNPL individuals during the non-breeding season are not protected by the Exclosures and may be found foraging and/or roosting in areas open to vehicles. As a result, SNPL adults and juveniles during the non-breeding season may be killed or injured from collisions with motorized vehicles.

Estimates of adult and juvenile SNPL lethal take and/or harm are largely based on past observations of injured and dead SNPL (Table 4-1). All numbers exclude SNPL found injured or killed due to predation. In some cases, take may have resulted from fence strike or motorized recreation; these indeterminate individuals were counted in Table 4-1 as incidental take. The annual mean minimum number of breeding adults in the HCP area from 2002 to 2023 was 157 breeding adults (Table 3-4). From 2001 to February 2024, 83 total dead or injured adult and/or juvenile SNPL were recovered in the areas open to recreation (motorized and/or non-motorized), and some were determined to have been killed or injured by trauma. As a result, these deaths could be attributed to motorized and non-motorized activities, including recreation activities, park operations, fence strikes, or other activities not related to recovery actions. Between 2002 and 2023, there were 19 instances of SNPL adults/juveniles being killed and/or injured due to the possibility of colliding with a fence during the breeding season in the HCP area. Starting in 2016, CDPR began lining the top of the seasonal exclosure fencing with a strip of thick plastic fencing (orange silt construction fencing) along most of the western and northern fenced areas to make the fencing more visible to CLTE nesting within this portion of the seasonal exclosure; the top lining is presumed to increase visibility to SNPL as well. The highest number of SNPL juveniles and/or adults found injured or dead with wing injuries that were attributed to collision with an exclosure fence was in 2016, when four juveniles and/or adults were found. Of the dead or injured SNPL found between 2001 and February 2024, a total of 49[53] were found during the breeding season and 34 dead or injured adult and/or juvenile SNPL were recovered during the non-breeding season.

Table 4-1. Summary of Injury and Mortality of Adult and Juvenile SNPL, 2001-February 2024

	Breeding Season		Non-Breeding Season		
Year	**Adults**	**Juveniles**	**Adults**	**Juveniles**	**Total**
2001	-	1 mortality	-	-	1
2002	2 mortalities	-	-	-	2
2003	1 injury	-	-	-	1
2004	-	-	2 mortalities	-	2
2005	-	-	-	-	0
2006	-	1 injury	-	-	1
2007	-	-	1 mortality	-	1
2008	-	-	2 mortalities	-	2
2009	-	1 mortality	1 mortality	-	2

[53] 21 of these birds were found at the very end of the season in September, after most breeding has concluded and SNPL were found in non-breeding flocks. As a result, they may not have been breeding in the HCP area and actually just migrated to the area to winter. In addition, one individual was found at the very beginning of the breeding season on March 1, before breeding had started.

Table 4-1. Summary of Injury and Mortality of Adult and Juvenile SNPL, 2001-February 2024

	Breeding Season		Non-Breeding Season		
Year	**Adults**	**Juveniles**	**Adults**	**Juveniles**	**Total**
2010	3 mortalities	1 injury	-	-	4
2011	-	2 mortalities	1 mortality	-	3
2012	1 mortality	-	1 injury	-	2
2013	2 mortalities	-	1 mortality	-	3
2014	1 mortality	1 injury	1 mortality	-	3
2015	1 injury	2 injuries	-	-	3
2016	4 mortalities 2 injuries	-	5 mortalities	-	11
2017	2 mortalities	1 mortality 2 injuries	5 mortalities	-	10
2018	4 mortalities	1 injury	4 mortalities	-	9
2019	4 mortalities	-	1 mortality	-	5
2020[1]	*	1 mortality	*	*	1
2021	2 mortalities	-	1 mortality	1 mortality	4
2022	1 mortality	3 mortalities	1 mortality	-	5
2023	1 mortality	1 injury	3 mortalities	-	5
2024[2]	-	-	3 mortalities	-	3
Total	**31**	**18**	**33**	**1**	**83**

Note: Table includes mortality and injury attributed to SNPL striking exclosure fences in addition to mortality and injury attributed to recreation, park operations, and other activities not related to recovery actions.

[1](*)2020-2021 – HCP area partially to fully closed as follows: Beach access restricted beginning March 23 and fully closed to vehicular recreation March 28. HCP area reopened to vehicle activities in phases: Phase 1, October 30, allowed ≤1,000 street-legal day use vehicles per day; Phase 2, February 19, 2021, added ≤1,000 day use OHVs per day and 100 beach camping units; and Phase 3, June 15, 2021, increased to 150 beach camping units. Oceano and Pismo Beach campgrounds closed March 17 – September 20, 2020. Parking lots adjacent to the beach had limited one-hour parking, and Oso Flaco Lake lot closed March 28 – May 21.

[2]2024 data are through February 2024, which marks the end of the 2023/2024 non-breeding season.

The highest number of juvenile and/or adult SNPL killed or injured was in 2016, when nine juveniles and/or adults were killed, and two juveniles were injured. Of these, five juveniles and/or adults were killed in the non-breeding season, and six juveniles and/or adults were killed or injured in the breeding season.[54] Furthermore, in 2017, 10 juvenile and/or adult SNPL were killed or injured, and in 2018, 9

[54] Beginning in the winter of 2016–2017, monitoring was increased to mostly daily monitoring during the non-breeding seasons. As a result, more birds may have been found due to more frequent monitoring.

juveniles and/or adults were killed or injured. These three years were considerably higher than all other years from 2001 through February 2024, with zero to five injuries and/or mortalities each year. Based on these past levels of take, this HCP anticipates a maximum of 16[55] juveniles and/or adults in a year could be injured or killed in the HCP area. In addition, because 16 juveniles and/or adults being injured or killed per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years will result in the maximum take levels, and other years will have lower take levels. As a result, this HCP estimates that no more than 40 juveniles and/or adults will be injured or killed in the HCP area over a 5-year period.

4.3.2.1.2 Take of Chicks and Eggs

Take of SNPL eggs and chicks during recreation activities, park operations, and/or other activities that are not related to recovery activities may occur by collision with motorized vehicles and by non-motorized activities (e.g., pedestrians stepping on eggs or picking up chicks). Take may also occur if eggs are abandoned because an adult is killed or injured in a collision with a motorized vehicle. Furthermore, take of chicks or eggs could occur if a nest is located in the riding area, where chicks and eggs are at risk of being killed, injured, or crushed by motorized and non-motorized activities, or during brood movement from an upland nesting site to an area closer to the shoreline. Typically, the eggs can be protected by a single-nest exclosure, or the chicks can be protected and directed out of harm's way. However, chicks and eggs could be injured, killed, or crushed if monitors do not find them soon enough. CDPR monitors may, in the future, capture chicks for captive rearing in the HCP area when they are at risk of being killed or injured by covered activities not related to covered species management activities (AMM 22), including new proposed activities. In this HCP, this situation could occur for 12 eggs (i.e., 4 nests of 3 eggs) and/or 12 chicks (i.e., 4 broods of 3 chicks) each year during the breeding season (see new AMM 22 in Table 5-2).[56] Additional take of eggs or chicks could occur if pedestrians step on eggs or chicks that are not protected within the Exclosures or within a single-nest exclosure. However, such incidents have not been documented in the HCP area; therefore, this risk of take is anticipated to be low. One instance occurred in 2023 of vandalism to a nest, where a park visitor damaged a circular single-nest exclosure in South Oso Flaco and removed the three SNPL eggs (Table 4-2). Park visitors may also pick up chicks (i.e., "capture" chicks). Although this event is rare, park visitors have picked up chicks and given them to park staff in the HCP area, including in 1994, 1998, and 2014.

Recreation, park operations, and other activities not related to recovery actions could also disturb attending adults or broods to the extent that chicks are separated from the attending adult and either abandoned, exposed to predators/inclement weather, or malnourished. This is especially true if adults and chicks leave the safety of the exclosures and enter an area open to vehicles where chicks could be separated from adults or struck by a vehicle and are at risk of lethal take. In the HCP area, chicks in the exclosures are carefully monitored, and most instances when they enter the open riding area are documented. Therefore, estimating when chicks are at risk of lethal take is possible based on past observations of these occurrences. Mortality or injury of a chick that enters an area open to vehicles is likely a rare event, however, due to the implementation of AMMs, such as stopping traffic in the area and directing chicks back to the safety of the exclosure.

[55] Although the majority of dead or injured adults/juveniles are likely found, not all dead or injured adults/juveniles are assumed to be detected due to SNPL that are scavenged or buried prior to discovery and SNPL cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured adults/juveniles may not have been discovered in some years in both the breeding and non-breeding seasons.

[56] These eggs and chicks would likely not survive if they were not captured for captive rearing.

Chicks are infrequently found dead in the HCP area as a result of motorized or non-motorized activities. However, between 1997 and 2001,[57] four dead chicks were found in the HCP area as a result of park operations, including recreation activities. These occurrences include one chick that was hit by a ranger vehicle in 1997, two chicks that were thought to be killed by a pedestrian in 1998, and one chick that may have been separated from the attending adult and died on the July 4 holiday in 2001. In 2001, two chicks were found abandoned during hatch at Arroyo Grande Creek during a time this area was open to public access, and two chicks were found dead in 2020 during a period when the park was open to pedestrian activity only (Table 4-2). Chick mortality from public recreational activity in the HCP area includes chicks found in South Oso Flaco, where only non-motorized activities occur: one chick was found dead in 2016 and two in 2018; however, due to the cryptic nature of the chicks, it is possible that some other small number of mortalities have gone undetected.

Table 4-2. Summary of SNPL Chick and Egg Mortality, Injury/Rescue, or at Risk of Take, 2001-2023

Year	Chicks				Eggs			
	Mortality	Injury/ Rescue	At Risk	Total	Mortality	Rescue	At Risk	Total
2001	3	-	-	3	1	-	-	1
2002	-	-	1	1	-	-	-	0
2003	-	2	-	2	-	5	3	8
2004	-	1	-	1	1	-	3	4
2005	-	-	-	0	-	-	-	0
2006	-	-	-	0	3	3	-	6
2007	-	-	-	0	5	-	-	5
2008	-	-	-	0	7	-	-	7
2009	-	-	-	0	11	-	3	14
2010	-	-	-	0	9	-	3	12
2011	-	1	8	9	-	3	3	6
2012	-	-	5	5	8	6	3	17
2013	-	-	3	3	4	6	-	10
2014	-	7	5	12	11	12	1	24
2015	-	-	10	10	4	-	-	4
2016	1	-	24	25	5	3	-	8
2017	-	2	15	17	11	6	1	18
2018	2	-	12	14	-	6	-	6
2019	-	-	14	14	3	3	-	6
2020[1]	2	*	*	2	*	*	*	0
2021	-	-	2	2	6	10	9	25
2022	-	-	7	7	7	5	-	12

[57] Monitoring of SNPL was not conducted regularly in the HCP area until 2001. Therefore, data prior to 2001 only include mortalities that were incidentally observed in the HCP area.

Table 4-2. Summary of SNPL Chick and Egg Mortality, Injury/Rescue, or at Risk of Take, 2001-2023

Year	Chicks				Eggs			
	Mortality	Injury/ Rescue	At Risk	Total	Mortality	Rescue	At Risk	Total
2023	-	-	6	6	8	1	22	31
Total	**8**	**13**	**112**	**133**	**104**	**69**	**51**	**224**

Note: Table includes mortality and injury attributed to recreation, park operations, and other activities not related to recovery actions. Only rescues included are those necessitated by impacts attributed to recreation, park operations, and other activities not related to recovery actions.

[1](*)2020-2021 – HCP area partially to fully closed as follows: Beach access restricted beginning March 23 and fully closed to vehicular recreation March 28. HCP area reopened to vehicle activities in phases: Phase 1, October 30, allowed ≤1,000 street-legal day use vehicles per day; Phase 2, February 19, 2021, added ≤1,000 day use OHVs and 100 beach camping units per day; and Phase 3, June 15, 2021, increased to 150 beach camping units. Oceano and Pismo Beach campgrounds closed March 17 – September 20, 2020. Parking lots adjacent to the beach had limited one-hour parking, and Oso Flaco Lake lot closed March 28 – May 21.

In addition to mortality, based on previous data collected in the HCP area, SNPL chicks have been observed in the open riding area where they are at risk of vehicle strike or being separated from an attending adult. The greatest number of chicks (i.e., 18 chicks) documented leaving the protection of the Exclosures and entering the open riding area where they were at risk of lethal take was in 2016, although chicks are known to have entered the open riding area in other years as well. Although these chicks are monitored and successfully directed back to the exclosure, they are at risk of being injured or killed for the period of time they are in the open riding area. In addition, although chicks in the HCP area are monitored closely, some portion of these chicks may enter the open riding undetected. For the purpose of this HCP, it is assumed that two broods (or six chicks) could enter the open riding area and be injured or killed prior to CDPR implementing AMMs. Chicks have also been observed without an attending adult after a prolonged disturbance, leaving them exposed to predation and inclement weather. As part of this HCP, CDPR may also capture chicks that could otherwise be injured or killed from covered activities without CDPR intervention (AMM 22). This HCP anticipates that each year CDPR may need to capture 12 chicks (i.e., four broods of three chicks) that could be injured or killed from covered activities and place them in a captive rearing facility. Based on past observations of chick mortality and chicks at risk of take, and taking into account the cryptic nature of chicks, this HCP anticipates that take could occur in the form of injury, capture, and/or mortality for a maximum of 28[58] chicks in a year during the breeding season. In addition, because 28 chicks being injured, captured, or killed per year is based on a worst-case scenario and is likely a high estimate of take in most years, this HCP includes a 5-year estimate that assumes only 1 year will result in the maximum take levels and other years will have lower take levels. Therefore, this HCP estimates that no more than 80 chicks over a 5-year period will be subject to take in the form of mortality, injury, capture, or harm during the breeding season.

The potential for incidental take of eggs (i.e., the potential for eggs to be crushed or abandoned) due to park operations, recreation activities, and other activities that are not related to recovery activities, was estimated based on the number of nests initiated outside of fenced areas that were at risk of

[58] It is assumed that a portion of dead or injured chicks are not detected due to chicks that are scavenged or buried prior to discovery and SNPL cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured chicks may not have been discovered in some years.

destruction by motorized and/or non-motorized activities (had they not been protected with fencing soon after their discovery) and by the number of nests that were abandoned in areas where adults could have been killed or subject to frequent disturbance by park operations, including recreation activities. The highest level of potential incidental take that occurred under the current conservation program was in 2014 when 6 nests with a total of 17 eggs were potentially abandoned due to their close proximity to non-motorized activities in South Oso Flaco, and 1 nest with 3 eggs in 6 Exclosure approximately 65 feet from the open riding area with a bumpout may have been similarly abandoned. The highest level of potential incidental take for nests initiated outside of fenced areas and at risk of destruction was in 2023, when 8 nests with 22 eggs were established in the open riding area and immediately protected with single nest exclosures (of which only 1 nest of 1 egg was abandoned), 1 nest with 3 eggs in South Oso Flaco was vandalized, and 1 nest with 1 egg near the open riding area protected by foredune fencing with a bumpout, was abandoned pre-term; this totals 10 nests and 26 eggs.

As part of this HCP, CDPR includes the option to remove eggs that are deemed vulnerable to covered activities, taking them to an available captive rearing facility, to ensure they are not harmed. In these cases, it is anticipated that the eggs could otherwise be harmed without CDPR intervention. This HCP anticipates that CDPR may have to remove 12 eggs (i.e., 4 nests with 3 eggs) that could be harmed by covered activities each breeding season and place them in a captive rearing facility. Based on this information, it is assumed that the potential for incidental take is a maximum of 37[59] SNPL eggs in some years. In addition, because 37 eggs being crushed or abandoned per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years will result in the maximum take levels, and other years will have lower take levels. In a few other years between 2003 and 2023 between 1 and 12 eggs have been abandoned due their close proximity to motorized and/or non-motorized activity or have been found outside the Exclosures resulting in an average of four eggs over this period. Therefore, the potential for incidental take due to park operations, recreation, and other non SNPL management-related activities is assumed to be no more than 80 eggs over a 5-year period.

Table 4-3. Summary of Estimated SNPL Take (Park Operations, Recreation, Non-Recovery Activities)

Activities Causing Take	5-year Running Take[1,2,3] of Individuals
Park operations, recreation, and other non-recovery activities	40 adults and/or juveniles; 80 chicks;[4,5] 80 eggs[4]

Notes:

[1]Take estimates do not include harassment.

[2]Numbers are based on past observations of worst-case mortality, injury, capture, etc. that have rarely been observed during the timeframe from 2002 to 2023 and do not happen every year. The numbers recognize that not every egg or SNPL may be detected. The 5-year running sum accounts for occasional years in which a higher amount of take may occur to ensure such unusual events do not trigger an amendment to the HCP.

[3]This HCP does not include annual take estimates, but the annual numbers presented in the text represent a worst-case scenario. If annual take numbers approach this worst-case scenario for any life stage during any one calendar year, CDPR will initiate additional consultation with USFWS to identify additional management actions that can be implemented. That

[59] Although the majority of crushed or abandoned nests are likely found, it is assumed that not all are detected due to eggs that are scavenged or buried prior to discovery and the cryptic size and coloration of the eggs. Therefore, this take estimate considers a worst-case scenario where additional crushed or abandoned nests may not have been discovered in some years.

Table 4-3. Summary of Estimated SNPL Take (Park Operations, Recreation, Non-Recovery Activities)	
Activities Causing Take	**5-year Running Take[1,2,3] of Individuals**
annual trigger for consultation stands at 16 adults/juveniles, 28 chicks, and 37 eggs from all covered activities other than recovery activities. [4]Take estimate includes salvage and rescue of SNPL eggs and chicks if they are observed to be threatened by park operations, recreation activity, and other non-recovery activities (AMM 22). In this case, 12 eggs and 12 chicks each year may be captured for captive rearing if they are determined to be threatened by covered activities not related to recovery activities, including new proposed activities. These are included in the total take number included in this table since the eggs and chicks would likely not survive if they were not captured for captive rearing and since eggs and chicks taken for captive rearing may, ultimately, not be reintroduced back into the population. [5]Take estimate is based on chicks that have been observed in the open riding area and subject to potential harm by recreation and other covered activities, including risk of vehicle strike. With the implementation of AMMs, such as escorting chicks back to the protection of the Exclosures, the risk of lethal take and/or harm is low.	

4.3.3 Anticipated Impacts of the SNPL Taking

This section describes the overall impacts of the anticipated take of SNPL within the HCP area and discusses the overall impacts from covered activities on the entire Pacific Coast SNPL population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

As stated previously, SNPL in the HCP area are anticipated to be predominantly affected by motorized activities, and SNPL are expected to be largely precluded from successfully breeding in the HCP area where motorized activities occur (Map 25), although much of the open riding area is within tertiary habitat where SNPL rarely if ever nest. Motorized activities affect SNPL by disturbing nesting, roosting, and foraging birds (section 4.3.1.1.1). Within primary, and to some extent secondary, habitat where motorized activities occur in the HCP area, SNPL are expected to have reduced nesting attempts. Motorized activities also reduce prey availability (i.e., reducing habitat quality by altering or reducing wrack, which provides essential habitat for talitrids); reduce habitat quality (e.g., removing/destroying objects such as kelp and driftwood associated with nesting); reduce microtopographic complexity, which provides cover from predators and inclement weather; and prevent establishment of foredune vegetation, which provide microhabitat features that can support nesting and roosting.

Non-motorized activities can also affect SNPL, including in areas where motorized recreation does not occur (e.g., Oso Flaco). SNPL will likely be precluded from successfully breeding in the HCP area where non-motorized activities occur (Map 25), depending on the type and intensity of non-motorized use. Intensive use of beaches by people outside of the HCP area, especially those in Los Angeles and Orange Counties, have rendered beaches with historical evidence of SNPL nesting unsuitable for nesting SNPL (Page and Stenzel 1981). The effects of non-motorized recreation can be greater during the breeding season when park visitation rates are high. The effects from non-motorized activities include disturbing nesting, roosting, and foraging birds (sections 4.3.1.1.2 through 4.3.1.1.9), making it less likely that SNPL will nest in areas where non-motorized activities are present. In addition, park visitors in the HCP area have been observed picking up SNPL chicks (i.e., capturing chicks) and separating them from their attending adult.

Special projects include activities required to meet a facility need, such as installing vault toilets (section 4.3.1.5.7). Special projects could directly affect up to 35 acres within the HCP area over the permit term. Although special projects will not be implemented within the area protected by the Exclosures, these projects could occur within SNPL breeding habitat and preclude SNPL from nesting if they are located within these areas.

The conservation program activities proposed for coverage under this HCP have been occurring in the HCP area for various periods of time prior to HCP preparation. For example, the current configuration of the Exclosures has been used in the HCP area since 2004. In addition, some recreation activities (e.g., motorized and pedestrian activities) have been occurring in the HCP for over a century (section 4.11.1). This historic, intensive use of the beaches and dunes in the HCP area likely resulted in low numbers of SNPL nesting in the HCP area long before the implementation of this HCP (Page and Stenzel 1981). Data obtained from the early estimates in the HCP area indicate that there were likely low numbers of SNPL in the HCP area in the decades prior to acquisition of the initial Oceano Dunes SVRA lands in 1974. Page and Stenzel (1981) found three pairs of adult SNPL (i.e., six total adults) in the northern section of the Nipomo Dunes (extending from north of the Santa Maria River mouth to Pismo Beach) during surveys in 1978. No SNPL were found at Pismo Beach during this survey. Page and Stenzel concluded that SNPL habitat at Pismo Beach was unsuitable due to historic human activity or development. The only previously reported records of SNPL in the section of the coast from Pismo Beach south through the Nipomo Dunes area were two SNPL nests at Pismo Beach in 1965 (Page and Stenzel 1981). As a result, the implementation of the conservation program at Oceano Dunes SVRA has likely increased SNPL numbers in the HCP area prior to the implementation of this HCP.

Since implementation, the conservation program has also successfully protected SNPL habitat in the HCP area and offset the effects of the covered activities to date. The conservation program is part of an ongoing program that has been particularly successful at protecting the breeding population of SNPL (Neuman, Nur, et al. 2024). This is demonstrated by looking at whether the HCP conservation program goals and objectives have been achieved, including SNPL Objective 1.1 to increase the size of the SNPL population breeding in the HCP area to meet or exceed 180 breeding SNPL, averaged over a moving 3-year window, and SNPL Objective 1.2 to maintain a 3-year moving average of at least 1.0 fledgling per male (section 5.2.1). Objective 1.1 has been met in the HCP area since 2014 when the 3-year breeding population size was 193. In addition, over the 5-year period from 2019 to 2023, the SNPL breeding population in the HCP area has averaged 207 breeding adult SNPL per year (range of 190–232), thus exceeding SNPL Objective 1.1 and the management potential recommended by the Recovery Plan for the HCP area portion of the Pismo Beach/Nipomo Dunes (Unit CA-83) management area (section 5.2.1). Objective 1.2 has been met in the HCP area since 2009, when the 3-year SNPL reproduction rate (3-year sum of fledglings over 3-year sum of minimum breeding males) was 1.31 fledglings per male. In addition, during the 5-year time period from 2019 through 2023, the ongoing conservation program has achieved a SNPL reproduction rate of 1.27 fledged per breeding male, which also exceeds SNPL Objective 1.2 and the Recovery Plan goal of 1.0 fledged young per breeding male for population stability and greater than or equal to 1.2 young per breeding male for population growth (USFWS 2007a). As a result, the continued implementation of the conservation program through this HCP is anticipated to provide a net benefit to SNPL and fully offset any impacts from covered activities by achieving the conservation program and Recovery Plan goals to meet or exceed 180 breeding SNPL averaged over a moving 3-year window and to maintain a 3-year moving average of at least 1.0 fledgling per male SNPL. By continuing to meet or exceed these goals, the HCP area is anticipated to continue to contribute to overall population growth for the Pacific Coast population of SNPL.

4.4 California Least Tern

Effects on CLTE and potential CLTE habitat in the HCP area are described in the following sections. Section 4.4.2 summarizes the potential effects and potential take of CLTE from covered activities. AMMs that address the effects are provided in section 5.3.1.2. Activities occurring in tertiary habitat for CLTE (Map 11) are not anticipated to affect the species unless specifically discussed in the following sections. Note that to provide a comprehensive understanding of the conservation program, this HCP describes

impacts that will not be included in the ITP but rather directly authorized under the Recovery Permit (TE-815214-10).

4.4.1 Direct and Indirect Effects of Covered Activities on California Least Tern

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects of covered activities on CLTE are possible and are discussed below. The OHMVR Division dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season. This program has been modified over the years based on CDFW and USFWS comments to avoid impacts to CLTE from covered activities, including activities implemented to foster the recovery of the species associated with the SNPL and CLTE management program. As a result, the effects on CLTE from covered activities that could occur during the breeding season are reduced substantially.

Although CLTE and SNPL share similar breeding habitat, effects are not expected to be the same due to life history and behavior differences. Some key differences include, but are not limited to, the following:

- CLTE do not occur in the HCP area outside of the breeding season (generally only present from April 15 to September 15).
- CLTE forage over water and not on land.
- CLTE do not forage at night.
- CLTE are not known to nest in North or South Oso Flaco and rarely nest outside the protection of the Southern Exclosure.
- CLTE gather after dusk and form a night roost.
- Chicks at later developmental stages are not constantly attended/brooded by adults.
- Sustained incubation begins after the first egg is laid.

Covered activities occur within all 4,593 acres of CLTE suitable habitat. This includes 698 acres of primary habitat, 250 acres of secondary habitat, 3,565 acres of tertiary habitat, and 80 acres of aquatic habitat (section 3.3.2.7). See Map 26 for the location of covered activities in relation to CLTE. As described in section 3.3.2.7, CLTE nests are typically found within the 6, 7, and 8 Exclosures. CLTE nests have also been found previously in the Boneyard Exclosure. The CLTE night roost has been located in both the 6 Exclosure and 7 Exclosure, or east of the Exclosures in a large single-nest exclosure. CLTE nests are rarely found outside the Southern Exclosure. However, some nests have infrequently been found outside the Southern Exclosure (e.g., a nest near Arroyo Grande Creek in 2005, a nest east of 6 Exclosure in 2020), and suitable breeding habitat for CLTE is present outside the exclosure. As a result, given similarities in terrestrial habitat preferences, this HCP describes potentially suitable CLTE habitat by using the categories primary, secondary, and tertiary habitat that were defined in section 4.3.1 for SNPL. A summary of the number of CLTE nests in each habitat category follows (Table 3-9, Map 13):

- Between 2005 and 2023, 859 CLTE nests were discovered in primary habitat.
- Between 2005 and 2023, 3 CLTE nests were discovered in secondary habitat.
- Between 2005 and 2023, no CLTE nests were observed in tertiary habitat.

Covered activities have different intensities of effects depending on the type of habitat (i.e., primary, secondary, and tertiary) affected and the type of activity (e.g., motorized, non-motorized, management-related) occurring in the habitat. For example, effects on CLTE in tertiary habitat are not likely because this habitat is generally low quality and CLTE do not use this habitat for nesting, foraging, and/or

roosting (section 3.3.2.7). In addition, effects on CLTE within primary or secondary habitat in areas where motorized recreation is not permitted are lower than in areas where motorized recreation is allowed because interaction/collision with recreational vehicles does not occur.

Motorized and non-motorized recreation are the predominant covered activities that can affect CLTE, as well as their habitat. Motorized recreation has the greatest potential for effects on CLTE (section 4.4.1.1.1). Motorized recreation occurs in 1,210 acres of CLTE habitat (i.e., approximately 423 acres within primary, 160 acres in secondary, and 627 acres within tertiary habitat). Non-motorized recreation can also affect CLTE, especially in areas where motorized recreation is not permitted. Non-motorized recreation occurs within approximately 2,622 acres of CLTE habitat where motorized recreation is not permitted (i.e., approximately 274 acres within primary, 90 acres within secondary, and 2,257 acres within tertiary habitat). Non-motorized recreation also occurs within the entire area open to motorized recreation. The effects of non-motorized recreation on CLTE depend on the intensity and type of use (e.g., numbers of park visitors to a given area), type of activity (e.g., dog walking, horseback riding, picnicking), and the type of habitat (i.e., primary, secondary, tertiary) affected.

The following sections describe the mechanisms by which covered activities could affect CLTE. Effects will be avoided and minimized, to the extent feasible, through implementation of AMMs. Therefore, not all effects are expected to rise to the level of take, as defined by FESA.[60] AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Table 5-3. Despite the implementation of AMMs, some take of CLTE adults, juveniles, chicks, and eggs will still occur due to covered activities. Expected take levels are described in greater detail in section 4.4.2.

4.4.1.1 Park Visitor Activities

4.4.1.1.1 Motorized Recreation (CA-1)

CLTE are not present during the non-breeding season (October 1 through February 28), and therefore, are not affected by activities during that time. In addition, vehicles driving within tertiary habitat are not expected to encounter breeding, foraging, or roosting CLTE. Therefore, activities in tertiary habitat do not affect CLTE since CLTE are not found in these locations.

Vehicle Strike. Within the HCP area, almost all CLTE nest within the Southern Exclosure (Map 13), a portion of the open riding area that is fenced within predator fencing and closed to entry during the breeding season (March 1 through September 30). CLTE adult, eggs, and chicks within the exclosure are protected from motorized recreation activities because motorized activities are not permitted in these areas; therefore, direct impacts (e.g., eggs being crushed, chicks and/or adults being struck) from motorized recreation to CLTE adults, nests, and eggs within the fenced areas are avoided.

Within the HCP area, CLTE nests have rarely been found outside the Southern Exclosure. For example, the last nest found outside the fenced area in a region open to vehicular recreation was in 2005 near the mouth of Arroyo Grande Creek. Although CLTE almost exclusively nest within the Southern Exclosure, CLTE could nest outside the exclosure in areas open to vehicular recreation in the future. If a CLTE establishes a nest in the riding area, the cryptic nature of CLTE nests and chicks makes it conceivable that a vehicle could crush eggs or chicks in an active CLTE nest that has not yet been identified by monitors. In addition, any incubating adult at the nest could be vulnerable to vehicle strike, although adults typically respond to disturbance by flying from the nest rather than sitting on the nest where they would be more vulnerable to vehicle strike.

[60] An NCCP will be prepared separately to provide CDFW coverage for incidental take of CLTE.

To reduce the possibility of a vehicle striking an individual or crushing a CLTE nest outside the Exclosures, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. In addition to searching for tracks, scrapes, or paired CLTE, monitors also note adult CLTE behavior that may be consistent with tending a nest or chick, such as CLTE dropping down to the ground outside an exclosure. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large a single-nest exclosure will be installed as soon as possible, thus reducing the likelihood of vehicle strike. Prior to hatch, silt fencing or small mesh chick fencing will be installed within the exclosure or attached to the lower portion of the exclosure fence to prevent CLTE chicks from traveling outside into the open riding area.

Based on the results presented in the SNPL and CLTE Annual Breeding Season Reports (Appendix G), since these AMMs began to be implemented as part of the SNPL and CLTE management program, the AMMs have been successful at protecting CLTE nests from motorized recreation (e.g., few adults, juveniles, chicks, and eggs have been found killed or injured/crushed by a vehicles) and increasing reproductive success. As a result, direct impacts to nesting CLTE outside the Exclosures due to motorized recreation will continue to be minimized. Although unlikely, some CLTE eggs, chicks, and adults/juveniles could still be struck by vehicles if they go undetected.

Unlike SNPL, CLTE forage by flying over water and thus are not found foraging in areas where motorized recreation occurs. As a result, CLTE are not affected by motorized recreation when foraging.

CLTE traverse and can roost in the open riding area, which is not fenced and is open to vehicles. In addition, adults have been observed feeding fledglings in the open riding area. Vehicles driving through these areas could strike individual adults, juveniles, or chicks that are walking or roosting in this area. Chicks and juveniles are most vulnerable to vehicle strike since chicks cannot fly out of harm's way and juveniles are inexperienced flyers and may not fly out of harm's way fast enough. In addition, vehicle disturbance can separate chicks from an attending adult and chicks can be left vulnerable to predation.

CDPR will continue to implement the SNPL and CLTE management program, which reduces the risk of vehicles striking a roosting CLTE in areas open to vehicles. Daily monitoring of CLTE adults, juveniles, and chicks will continue to be conducted during the breeding season. If chicks are observed to be in harm's way (e.g., in the open riding area), vehicle traffic flow will be diverted or regulated to allow the safe movement of the chicks out of the area. If a CLTE nest is protected by a single nest exclosure, prior to hatch, silt fencing or small mesh chick fencing will be installed within the exclosure or attached to the lower portion of the exclosure fence to prevent CLTE chicks from traveling outside into the open riding area. Few adults, juveniles, and chicks have been documented as injured or killed in the HCP area due to vehicle strike. As a result, AMMs will continue to minimize the risk of a vehicle striking a CLTE in the open riding area. Although unlikely, some vehicle strike could still occur.

In recent years, CLTE have selected an area for the night roost within the 6 Exclosure, 7 Exclosure, and east of the Southern Exclosure in a large-single nest exclosure. Prior to the 2020 season, the night roost had been located within the Southern Exclosure. Should CLTE establish a night roost in an area outside of a seasonal closure that is accessible to vehicles, then vehicles can strike or disrupt night-roosting CLTE. To reduce the risk of vehicle strike, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Natural Resource staff will continue to closely monitor the CLTE night roost and will be able to identify most changes in roosting behavior. If the location of the night roost is found in the open riding area, CDPR has a protocol in place to protect the CLTE in the night roost from disturbance by motorized activities, including, but not limited to, closing off the area with fencing as soon as possible and implementing an appropriate no-disturbance buffer of 330 feet, or other distance based on best available site-specific information and in consultation with Wildlife Agencies,

around the night roost. Thus, impacts to CLTE in the night roost resulting from vehicle activity will continue to be minimal.

Nesting Disturbance. Nesting CLTE in the riding area or within Southern Exclosure but close to open riding area can be disturbed by nearby motorized recreation. Mortality, injury, and chronic disturbance of breeding adults from motorized activities can also indirectly affect chicks or eggs. Chicks or eggs can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, eggs can be buried by sand or not properly incubated. These effects are exacerbated if human disturbance coincides with periods of high wind or extreme temperature. Breeding colonial waterbirds, such as CLTE, are particularly susceptible to human disturbance from motorized and non-motorized recreation activities (Erwin 1989, Rodgers and Smith 1995). Human disturbance can increase both egg and chick mortality.

In previous studies, colonies of nesting colonial CLTE were observed to determine distances at which birds flushed in response to human disturbance. Erwin (1989) recommended a buffer distance of 328 feet (100 meters) for least terns in Virginia. Rodgers and Smith (1995) recommended a buffer distance of 505 feet (154 meters) in Florida. In a letter sent to CDPR on March 3, 2016, CDFW recommended a minimum 330-foot (approximately 100 meter) buffer to avoid take of CLTE (CDFW 2016). As a result, a buffer of 330 feet was used from 2016 to 2020 to protect CLTE nests in the HCP area. In 2021, the buffer increased to 984 feet to comply with an agreement between CDPR and CDFW as stated in the BMP. Based on observations from daily monitoring in the HCP area associated with the SNPL and CLTE management program, the 330-foot buffer was effective to minimize disturbance to nesting CLTE from motorized recreation and this will be the minimum buffer distance unless, in consultation with Wildlife Agencies, best available site-specific information indicates a different buffer is appropriate. As a result, disturbance to nesting CLTE associated with motorized recreation will continue to be minimal.

Increased Predators. Recreationists increase the presence of trash, most of which is disposed of properly in trash bins or dumpsters. However, any trash that is accessible to predatory species may artificially increase the number of individual predators, including gulls, in CLTE habitat and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring visitors to deposit all trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. CDPR will continue to use covered dumpsters with openings on the side to attract less gulls. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches and seasonally remove trash by mechanical means. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. As a result, this effect is reduced. However, generalist predators that forage on refuse continue to be present in the HCP area (i.e., coyotes, gulls, crows, and ravens) and are often suspected of preying on CLTE eggs, chicks, and juveniles.

Reduced Habitat. Motorized recreation in the non-breeding season can alter dune vegetation and topography necessary for breeding. Specifically, motorized recreation can reduce vegetation, organic surface materials (e.g., driftwood and wrack), and microtopography (e.g., hummocks) required for CLTE breeding and/or roosting. Altering these habitat features can increase CLTE exposure to predators or inclement weather during the breeding season. The ongoing SNPL and CLTE management program mitigates for these non-breeding season effects by placing natural materials such as driftwood and wrack in the Southern Exclosure to ensure cover from predators and inclement weather is available in the protected areas; and seeding and planting foredune species, if needed, to ensure exclosure areas continue to provide cover from predators and inclement weather during the nesting season. Therefore, the effects on CLTE from non-breeding season habitat alteration will be minimal.

4.4.1.1.2 Camping (CA-2)

The designated campgrounds (i.e., North Beach Campground and Oceano Campground) in the HCP area are not located within suitable CLTE breeding, foraging, or roosting habitat. Therefore, activities in these areas do not affect CLTE.

Vehicle Strike. Camping vehicles driving through tertiary habitat do not affect CLTE since CLTE are not known to utilize tertiary habitat for nesting and/or roosting. Camping vehicles driving within primary and/or secondary CLTE breeding and/or roosting habitat can cause similar effects on CLTE in the same overall area as those described for motorized recreation (section 4.4.1.1.1). As a result, the discussion of motorized recreation effects applies to camping vehicles as well.

Nesting Disturbance. Camping activities outside the designated campgrounds within tertiary habitat in the open riding area south of Post 2 do not affect CLTE since CLTE are not known to nest, forage, or roost in these areas.

Beach fires and other prolonged activities associated with camping outside the designated campgrounds within primary and/or secondary habitat in the open riding area south of Post 2 can disturb any nearby nesting CLTE, causing the eggs and/or chicks to be left unattended for long periods and potentially exposing them to predators and/or extreme temperatures. However, camping outside the designated campground areas within primary and secondary habitat occurs in areas where CLTE do not typically nest (i.e., outside the Exclosures). To further minimize impacts of camping activities outside the designated campgrounds, CDPR will continue to implement the SNPL and CLTE management program. Specifically, CDPR will continue to establish and maintain a 330-foot, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, avoidance buffer around CLTE nests within the HCP area. Camping and parking is not allowed within 100 feet of the buffer fencing, to ensure camping activities do not encroach on or disturb nesting CLTE. In addition, CDPR staff will continue to hand out educational materials on CLTE to visitors in the HCP area to prevent visitors from disturbing CLTE nests and chicks.

Increased Predators. Campers typically generate more trash than day users, which can artificially increase the number of predators in areas being used by CLTE and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes providing all campers with plastic garbage bags to ensure trash is removed from the camp area. CDPR staff will also continue to pick up trash in the HCP area on a regular basis and seasonally use a mechanical trash remover twice per year in approved targeted areas. In addition, CDPR implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. As a result, this effect is reduced. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on CLTE eggs, chicks, adults, and juveniles.

Reduced Habitat. Collecting driftwood or other naturally occurring materials can reduce the quality of cover used by chicks and adults as shelter from inclement weather or predators. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes placing woodchips, large woody material, beach wrack, and native plants (as necessary) in the Southern Exclosure to serve as natural shelter. The placement of woodchips, large woody material, beach wrack, and native plants in the Southern Exclosure has been successful at providing natural shelter for CLTE in the exclosure in the past. As a result, this effect is considered to be minimal.

4.4.1.1.3 Pedestrian Activities (CA-3)

Nesting Impacts. CLTE are not present during the non-breeding season (October 1 through February 28) and therefore, are not affected by activities during that time. The majority of CLTE nest within the

Southern Exclosure (Map 11), a portion of the open riding area that is fenced with predator fencing and closed to entry during the breeding season (March 1 through September 30). CLTE adults, eggs, and chicks within the exclosure are protected from pedestrian activities because pedestrians are not permitted in these areas; therefore, direct impacts (e.g., eggs being crushed) from pedestrian activities to CLTE adults, eggs, and chicks within the exclosure are avoided.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest outside the exclosure in areas open to pedestrians. Within the HCP area, CLTE nests have rarely been found outside the fenced areas. However, if a CLTE establishes a nest outside the Exclosures in an area open to pedestrians, the cryptic nature of CLTE nests and chicks makes it conceivable that a pedestrian could crush eggs or chicks in an active CLTE nest that has not yet identified by monitors. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Exclosures. Monitoring will also continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. In addition, any nests found in the open riding area are quickly protected by symbolic or wire fence and a single-nest exclosure with a minimum 330-foot radius, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, is installed as soon as possible. As a result, the effects of pedestrian activity on nesting CLTE are considered to be minimal.

CLTE nesting in the riding area or within Southern Exclosure but close to open riding area can be disturbed by nearby pedestrian activities. Chronic disturbance of breeding adults resulting from pedestrian activities near the Southern Exclosure can also indirectly affect chicks or eggs. Chicks or eggs can be abandoned, left unattended for prolonged periods of time, and/or exposed to predation. In addition, eggs can be buried by sand or not properly incubated. These effects are exacerbated if human disturbance coincides with periods of high wind or extreme temperature. Breeding colonial waterbirds, such as CLTE, are particularly susceptible to human disturbance from motorized and non-motorized recreation activities (Erwin 1989, Rodgers and Smith 1995). Human disturbance can increase both egg and chick mortality. To reduce human disturbance to nesting CLTE, CDPR implements a minimum 330-foot, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, buffer to protect CLTE nests in the HCP area (CDFW 2016). Based on observations from daily monitoring in the HCP area associated with the ongoing SNPL and CLTE management program, the 330-foot buffer has minimized disturbance to nesting CLTE from recreation. As a result, disturbance to nesting CLTE associated with pedestrians will continue to be minimal.

Stationary activities, such as picnicking and sunbathing, can displace CLTE for long periods. When adults defend a nest against an intruder, eggs and/or chicks are left unattended and exposed to inclement weather, heat stress, and/or predation. In addition, foraging birds can spend their time avoiding disturbance and become energetically stressed. Within the HCP area, the ongoing SNPL and CLTE management program includes implementing the 330-foot avoidance buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, to ensure stationary pedestrian activities do not encroach on CLTE nests. If a CLTE nest is found in the 48-acre foredune, the area is closed to the public. In addition, if CLTE are observed being disturbed during roosting, monitors ask visitors to relocate farther away from the birds, as needed. As a result, the effects of human disturbance from stationary activities on nesting and/or roosting CLTE is considered to be minimal.

If a CLTE chick enter an area open to pedestrians, a well-meaning visitor may attempt to “rescue” the chick by picking it up and moving it to another location or bringing it to park staff. This has been documented in the HCP area in 2010 when a park visitor picked up an injured fledgling CLTE in the open riding area and gave it to park staff. To reduce the potential for this situation to occur, CDPR will continue to implement the SNPL and CLTE management program, which includes handing out

educational materials on CLTE to visitors in the HCP area to prevent visitors from disturbing CLTE nests and chicks. Captive care/rehabilitation is not currently an option for CLTE. Therefore, CDPR would continue to determine the best approach to address this situation in consultation with the Wildlife Agencies, including the option to reunite/place the chick in another nest in the exclosure, if appropriate. Based on the results presented in SNPL and CLTE Annual Breeding Season Reports (Appendix G) since the SNPL and CLTE management program was initiated, the program has been successful at preventing this situation, and a visitor picking up a chick is a very rare event.

Foraging and/or Roosting Disturbance. Pedestrians moving through aquatic habitat areas occupied by foraging CLTE (e.g., Oso Flaco Lake) can disturb CLTE foraging and/or roosting in these areas. In addition, the footbridge hand railing at Oso Flaco Lake may be used by CLTE for perching after chicks have fledged and adult birds are teaching fledglings to fish in the lake, although this behavior has not been observed for several years. Pedestrians at the lake can disturb CLTE adults and fledglings and deter them from foraging in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. To ensure CLTE are not disturbed during foraging activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, when CLTE are present at Oso Flaco Lake, CDPR staff will provide visitors with information on presence and activity at the lake, as well as guidelines to avoid disturbing CLTE in the area. In addition, CDPR monitors will continue to retain the option to close the boardwalk access to Oso Flaco Lake or temporarily prohibit certain types of public use on the boardwalk if, in the opinion of monitors, visitor activity is disrupting CLTE foraging behavior. As a result, effects on foraging CLTE are considered minimal.

Increased Predators. As with all visitors, pedestrians increase the presence of trash, which can artificially increase the number of predators, including gulls, in CLTE habitat and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring visitors to deposit all trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. CDPR will continue to use covered dumpsters with openings on the side to attract less gulls. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches and seasonally remove trash by mechanical means. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing CLTE adults, juveniles, chicks, or eggs. As a result, the effects are reduced. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on CLTE eggs, chicks, and juveniles.

4.4.1.1.4 Bicycling and Golfing (CA-4)

Golfing activities do not affect CLTE since the golf course is not located within or near CLTE breeding, foraging, or roosting habitat.

Few (if any) studies have been conducted that document the effects of bicycles on shorebird species. McLeod et al. (2013) observed waterbirds to have shorter flight initiation distances to cars compared with bicycles, though the number of observations were too few to draw any conclusions. Bicycle riding likely results in a different response than to motor vehicles because bicyclists are more visible to shorebirds. Bicycles also typically travel at slower speeds than motor vehicles and thus can disturb birds for longer periods of time. McLeod et al. (2013) also found that pedestrians (singly or in a group) often evoked longer flight initiation distances in 39 species of waterbirds than bicycle riders. Therefore, the discussion above regarding pedestrian effects (section 4.4.1.1.3) on CLTE is likely relevant to bicycle riding, but the effects from bicycle riding may be less intense. In addition, bicycles are not allowed in the Oso Flaco Lake area and bike riding within habitat occupied by CLTE is infrequent. With the implementation of the ongoing SNPL and CLTE management program AMMs discussed for pedestrian

activities above (section 4.4.1.1.3), effects from bicycle riding on CLTE have been minimal and will continue to be minimal.

4.4.1.1.5 Fishing (CA-5)

Nesting Impacts. The effects of fishing on CLTE are similar to the discussion above regarding pedestrian effects (section 4.3.1.1.3); however, the effects are limited to the ocean shoreline and lakes (e.g., Oso Flaco Lake) where CLTE are more likely to be foraging and/or roosting.

Almost all CLTE nest within the Southern Exclosure where fishing is not allowed; therefore, effects on nesting CLTE from fishing are rare (if any) since the shoreline is also closed to the public, including for fishing, in the Southern Exclosure area south through North Oso Flaco Exclosure. Visitors can fish along the shoreline in South Oso Flaco, but since CLTE have not been observed nesting in the South Oso Flaco area from 2005 to 2023, fishing in that area does not currently affect CLTE. If CLTE were to nest in South Oso Flaco, they could be affected if fishing activities remained near CLTE nests for extended periods of time. Fishing can disrupt incubation, thereby increasing the exposure of chicks and/or eggs to extreme temperatures or predation. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat to ensure that any nests in the riding area are quickly protected with symbolic or wire fence and a single-nest exclosure with a 330-foot radius buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, is implemented around the nest. If fishing activity is observed disturbing CLTE, visitors will be asked to relocate farther away from nests, and fencing will be adjusted, as needed. As a result, direct impacts to CLTE nests outside the Southern Exclosure resulting from fishing activities is considered to be minimal.

Foraging Impacts. People fishing generally occupy habitat longer than pedestrians who are just passing through. As a result, foraging and/or roosting CLTE may avoid areas near fishing activities and are less at risk of disturbance. If fishing activities do remain near foraging and/or roosting CLTE for extended periods of time, they can disrupt foraging for long periods of time, thereby disrupting normal foraging behavior and potentially causing adults and/or chicks to become energetically stressed. To reduce impacts to foraging CLTE, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, if fishing activity is observed disturbing CLTE, visitors will be asked to relocate, as needed. Monitors will also continue to retain the option to close access to Oso Flaco Lake, as needed, to ensure foraging and/or roosting birds are not disturbed. As a result, effects of fishing activities on CLTE foraging and/or roosting birds is considered to be minimal.

Increased Predators and Entanglement. Discarded fishing line or hooks can entangle or pierce CLTE adults, juveniles, and chicks, including at Oso Flaco Lake. In addition to trash, discarded fishing bait may further attract predators to areas where CLTE are known to forage, roost, and/or nest and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes encouraging and educating anglers about proper disposal of fishing lines, hooks, and bait in trash receptacles. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. As a result, this effect will continue to be minimal.

4.4.1.1.6 Dog Walking (CA-6)

Nesting Impacts. CLTE are not present during the non-breeding season (October 1 through February 28) and therefore, are not affected by activities during that time. Almost all CLTE nest within the Southern Exclosure, a large portion of which is enclosed by predator fence. Dogs are not allowed in the Southern Exclosure. Therefore, CLTE adults/juveniles, eggs, and chicks within the exclosure are protected from direct impacts (e.g., eggs being crushed) from dogs.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE could nest outside the protection of the exclosure in areas open to recreation, including dog walking. CLTE nests have rarely been found outside the Southern Exclosure. For example, nests were found in the riding area where dogs are allowed in 2020 east of 6 Exclosure and in 2005 near the mouth of Arroyo Grande Creek. However, if a CLTE establishes a nest outside the exclosure in the riding area, the cryptic nature of CLTE nests and chicks makes it conceivable that a nest that has not yet identified by monitors could be impacted.

The presence of dogs has the potential to affect the behavior, distribution, survivorship, and fecundity of CLTE. CLTE likely have a similar reaction to dogs near their nests as SNPL. Incubating CLTE are likely to respond to dogs by leaving the nest to defend it from approaching dogs, thus exposing eggs to inclement weather or predation or leaving chicks unattended. Unleashed dogs can chase CLTE chicks and adults, causing chicks to become separated from adults, and/or trample nests, with unrestrained dogs able to traverse a much larger area and disrupt a greater number of birds. For example, dogs have been observed destroying nests at Santa Clara River, Ormond Beach, and Tijuana River in California (Caffrey 1998); however, there are no records of this occurring in the HCP area. Furthermore, such impacts are unlikely within the HCP area because dogs are only allowed when they are on leashes no longer than 6 feet and under the control of the owner at all times.

CDPR will also continue to implement the SNPL and CLTE management program. Therefore, monitors will continue to search daily for CLTE nests in the riding area and protect them with an individual nest exclosure. A large single-nest exclosure will be installed with a minimum buffer distance 330 feet from the nest to the open riding area, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, to ensure that recreation activities do not disturb nesting CLTE. In addition, additional fencing (i.e., bumpout) will be installed to enlarge the Southern Exclosure if necessary, to provide a 330-foot buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, to ensure that activities such as dog walking do not disturb nesting CLTE. As a result, the effects of dogs on nesting CLTE is considered to be minimal.

Foraging and/or Roosting Disturbance. Foraging CLTE are not impacted by dogs because CLTE forage over water. Impacts from dogs on roosting CLTE are minimal because dogs are not allowed in the Southern Exclosure, where CLTE form their night roost and where many CLTE roost during the day. In addition, only service dogs that are on a leash and under the control of their owner are allowed in the south/southeastern portion of Oceano Dunes SVRA, including around Oso Flaco Lake. CDPR staff strictly also enforces the dog leash regulation in any other area where dog activity can impact roosting CLTE.

4.4.1.1.7 Equestrian Recreation (CA-7)

Nesting Impacts. Almost all of the breeding CLTE population within the HCP area nests within the Southern Exclosure, where horses are not allowed. Therefore, CLTE adults/juveniles, eggs, and chicks within these areas are protected from direct impacts (e.g., eggs being crushed) from horses.

Most equestrian activity occurs in the northern portion of the HCP area and other areas where CLTE are not known to nest. In addition, the Southern Exclosure shoreline is closed to equestrian activity during the breeding season. Although not expected, if CLTE nest outside the Southern Exclosure, where equestrian activity can occur, equestrian activity would generally have the same types of effects on CLTE as pedestrians (section 4.4.1.1.3).

CLTE nests were documented as being destroyed by horse trampling at Tijuana River in California (Caffrey 1998). To reduce any potential impacts from equestrian activity, CDPR will continue to implement the SNPL and CLTE management program. Therefore, additional fencing (i.e., bumpout) will be installed to enlarge the Southern Exclosure if necessary, to provide a 330-foot buffer, or other

distance based on best available site-specific information and in consultation with Wildlife Agencies, and to ensure activities on the eastern side of the fenceline do not disturb nesting CLTE. Monitors will also continue to search daily for CLTE nests outside the seasonal exclosure and protect them with an individual exclosure. A large single-nest exclosure will be installed with a minimum buffer distance 330 feet from the nest to the open riding area, other distance based on best available site-specific information and in consultation with Wildlife Agencies, to ensure that recreation activities do not disturb nesting CLTE. As a result, the effects of equestrian activity on nesting CLTE will continue to be very minimal.

4.4.1.1.8 Boating/Surfing (CA-8)

Nesting Impacts. Boaters and surfers do not affect nesting CLTE because the Southern Exclosure shoreline is closed to boat landings and surfers during the breeding season.

Foraging and/or Roosting Disturbance. Surfing, small boat, and paddleboard launchings along the beach may have similar effects on roosting and/or foraging CLTE as pedestrians (section 4.4.1.1.3). However, interior least tern have been observed to exhibit greater average flush distances in reaction to a walking approach than an approaching motor boat (Rodgers and Smith 1995); therefore, effects from these activities are likely less intense than those for pedestrian activities.

Boaters on Oso Flaco Lake can disrupt foraging and/or roosting CLTE. However, boating on Oso Flaco Lake is uncommon. In addition, as part of the ongoing SNPL and CLTE management program, CDPR can restrict access to Oso Flaco Lake if monitors observe conflicts with foraging and/or roosting CLTE. As a result, the effects of boating at Oso Flaco Lake on CLTE are considered to be minimal.

Increased Predators. Surfing, small boats, and paddleboard launchings can disturb gull flocks foraging on the shoreline and displace gulls into areas where CLTE nests, chicks, or adults are located, thus increasing the risk of predation. However, in accordance with the Superintendent's Order (section 1.5.7) all surfing, boating, and paddleboarding activities are not allowed along the Exclosure's shoreline. CDPR will also continue to implement the SNPL and CLTE management program, which includes implementing a predator management program in the HCP area. As part of the ongoing predator management program, CDPR monitors and controls avian predators when necessary (section 2.2.2.1.2). As a result, this effect is considered to be minimal.

4.4.1.1.9 Aerial/Wind-Driven Activities (CA-9)

Nesting Impacts. Biologists believe shorebirds may perceive kites as potential avian predators; therefore, kite flying and kite boarding can be extremely disruptive to breeding CLTE. Per Superintendent's Order (section 1.5.7), although wet launching and kite boarding in the water is allowed to Post 6 year-round, dry land launching and landing is only permitted between Pismo Creek and Pier Ave. Additionally, a Superintendent's Order prohibits kite flying and public UAS use south of Pier Avenue during the CLTE breeding season. The kite flying and kite boarding prohibition is also strictly enforced in areas where these activities can impact CLTE. As a result, disturbance to CLTE due to kite flying, kite boarding, and/or UAS use is avoided.

4.4.1.1.10 Holidays (CA-10)

Vehicle Impacts. Oceano Dunes SVRA closes the park to additional vehicles once the limits prescribed by Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) on any holiday are reached. As a result, the effects of motor vehicles during holidays do not change from those discussed in section 4.4.1.1.1.

Nesting and Foraging Impacts. Pedestrians are not subject to limits in the HCP area, and some holidays (e.g., the July 4 holiday) attract large pedestrian crowds to area beaches. Effects from increased crowds are similar to those described for pedestrian activities (section 4.4.1.1.3), but the amount and type of

disturbance can be more frequent and/or longer in duration. High levels of pedestrian traffic can cause repeated flushing of adults. Frequent flushing of adults can keep adults from incubating a nest and/or feeding chicks, potentially reducing rates of development. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitoring within the HCP area will continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. In addition, CDPR staff will continue to hand out educational materials on CLTE to visitors in the HCP area to prevent visitors from disturbing CLTE nests and chicks. As a result, any increased impacts from holidays are considered to be minimal.

Fireworks are prohibited in the HCP area; however, once a year the City of Pismo Beach has a fireworks display on July 4 on the Pismo Beach pier. Therefore, during the July 4 holiday, many spectators congregate in the northern portion of the HCP area, which is over 2 miles from the northern edge of the Southern Exclosure where CLTE typically nest, roost, and/or forage during the breeding season. As a result, crowds associated with the City of Pismo Beach fireworks display are located in areas where they likely do not affect CLTE. Although fireworks are illegal in the HCP area, illegal fireworks have been regularly observed during the July 4 week in or near CLTE breeding habitat and they have been observed disturbing nesting, roosting, and/or foraging CLTE adults and chicks. Disturbance from fireworks causes CLTE to flush or move from the area, which results in increased vigilance or stress, decreased foraging, and/or decreased incubating (Patton 2009). To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. To minimize potential illegal fireworks use and any effects from increased crowds due to legal fireworks, CDPR staff will continue to employ additional ranger staff at Oceano Dunes SVRA to enforce regulations during these times. In addition, CDPR will continue to increase staff near the Southern Exclosure to reduce illegal firework use in this area. Therefore, effects from fireworks or other actions that can disturb breeding CLTE during the July 4 holiday are reduced.

4.4.1.1.11 Special Events (CA-11)

As with holidays, the vehicle limits prescribed by Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) are not exceeded during special events, and Special Event Permits do not authorize activities in areas that are otherwise closed to visitors. Thus, the potential for a given special event to affect CLTE depends on the nature of the event being approved and is generally similar to non-special event activities. For example, the effects of a special event involving OHVs is the same as the effects of typical motorized recreation (section 4.4.1.1.1), and a wedding or family reunion near Grand Avenue has effects similar to pedestrian activities (section 4.4.1.1.3).

Special events are potentially different from typical non-special event activities in a few ways. First, many events tend to focus participants in the event area, which can mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Effects on CLTE from concentrating spectators and vendors in an area is similar to the effects described for motorized recreation (section 4.4.1.1.1) and/or pedestrian recreation (section 4.4.1.1.3); however, the effects can be more frequent and/or longer in duration due to the increased number of visitors. Second, special events change use patterns and increase visitation on days that might not otherwise be at capacity; however, the actual effects from these variations are likely no different than those described above, depending on the activities associated with the event.

Special events are evaluated for potential effects on covered species to determine whether AMMs are necessary to include in the permit conditions. Review is based on past experience and is dependent on the event location, timing, and potential to impact covered species like CLTE. For example, larger special event conditions may include AMMs, such as assigning trained CLTE monitors or additional enforcement staff or adjusting scheduling, location, or paths of travel, as necessary, for each event. With the

implementation of AMMs during special events, impacts from special events are considered to be minimal.

UAS may be used in the future for video production within the HCP area. UAS will not be allowed south of Post 5 during the breeding season. Therefore, UAS are not expected to affect nesting CLTE. UAS could disturb foraging and/or roosting CLTE during the breeding season if foraging or roosting occurs north of Post 5. However, Wilson et. al. (2023) assessed responses to drones by a variety of shorebirds and found most species are unlikely to take flight, especially when flights are at higher distances (above 197 feet). A previous study by Vas et al. (2015) also assessed reactions by a variety of waterbirds to approaches by drones and found that the birds remained unaffected in most cases. These studies suggest there is the potential to use drones without significant disturbance.

All UAS operations will be consistent with CDPR policies regarding UAS use. Special-event UAS operators must receive a permit to operate over CDPR lands and must comply with 14 CFR Part 107, which establishes the minimum safety standards for small UAS operations in the United States. As part of their permit to operate, any non-CDPR person conducting UAS filming will be required to follow AMMs to reduce impacts to covered species. For example, during the breeding season, non-CDPR UAS will not be allowed along the shoreline south of Post 4.5 and will be limited whenever necessary to avoid impacting CLTE. In addition, a trained CLTE monitor will accompany non-CDPR UAS operators at any time of year potential impacts to covered species are anticipated. As a result, impacts of UAS to foraging and/or roosting CLTE are expected to be minimal.

4.4.1.2 Natural Resources Management Program

4.4.1.2.1 Covered Species Management

Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (CA-12a)

Seasonal Exclosure and Symbolic Fencing

Seasonal exclosure and symbolic fencing are installed and maintained in the HCP area each breeding season as part of the ongoing SNPL and CLTE management program. Seasonal exclosure and symbolic fencing is installed by March 1, before CLTE have arrived, and it is removed starting October 1, which is after the date when all nests and broods have a known fate and the breeding season has ended. As a result, initial installation and removal of the seasonal exclosure fencing do not affect CLTE.

Seasonal exclosure and symbolic fencing must be maintained throughout the breeding season to ensure integrity against predators and human disturbance. Symbolic fence is installed seasonally at South Oso Flaco, Arroyo Grande Creek, and at the shoreline boundaries of the Southern Exclosure and North Oso Flaco. Since CLTE have not been observed nesting in these areas where symbolic fence is present, maintenance does not affect nesting CLTE.

Vehicle Strike. The Southern Exclosure, where most CLTE are known to nest, has seasonal exclosure fencing that must be maintained throughout the breeding season to ensure integrity against terrestrial predators and human disturbance. Bumpouts are also installed to further protect nests from human disturbance, when needed. Fence maintenance can be conducted by hand or by heavy equipment and may have different levels of impact depending on the method used. Maintenance of the fence can occur multiple times in a week and may involve extended or repeated visits to the nesting sites. Maintenance vehicles may occasionally need to drive on the Southern Exclosure shoreline, within bumpouts, and very infrequently may also need to drive just inside the seasonal exclosure to access the eastern fence. Although CLTE do not typically nest outside the seasonal exclosure along the shoreline or in bumpout

areas adjacent to the exclosure fence, a nest could be established outside the fence and chicks could be present and thus could potentially be crushed by a maintenance vehicle driving within these areas. However, to minimize the risk of maintenance vehicles striking a CLTE, nests, or chicks while driving within the Southern Exclosure or bumpouts, CDPR staff are escorted by monitors permitted by USFWS. If CLTE are nesting nearby, have broods present, or otherwise observed to be disturbed, maintenance work will be delayed or cancelled. In addition, CDPR staff are trained to operate a vehicle on the closed shoreline or other closed areas where CLTE may be present, including scanning ahead of the vehicle for CLTE chicks and keeping speeds at or below 5 mph. As a result, effects are considered to be minimal.

Nesting Disturbance. Both heavy equipment and hand maintenance of the fence and bumpout installation can disturb nesting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks could be depredated, inadequately fed, or flushed into the open riding area. Maintenance using heavy equipment is typically shorter in duration than maintenance by hand and likely results in fewer impacts to nesting CLTE than hand maintenance. In addition, effects from seasonal exclosure maintenance have been minimal in the past due to the implementation of established protocols in the SNPL and CLTE management program. Specifically, fence maintenance and bumpout installation are timed to avoid windy periods or other inclement weather. In addition, monitors survey the area prior to conducting fence maintenance activities. If a nesting CLTE is in a location where it can be impacted by activities, monitors postpone maintenance, if necessary, and remain on site during fence maintenance/installation to minimize disruption to CLTE. Furthermore, if chicks are flushed out of the exclosure during fence maintenance and/or bumpout installation, monitors attempt to follow and protect the chicks until they move back inside the exclosure. Overall, fenced protected areas have been shown to increase CLTE and other shorebirds' reproductive success in other locations (Isaksson, Wallander and Larsson 2007, Hardy and Colwell 2008, Wilson and Colwell 2010, Pearson, Knapp and Sundstrom 2014). In the HCP area, reproductive success has increased since the implementation of the SNPL and CLTE management program, including the use of the seasonal exclosure; therefore, the seasonal exclosure fence has provided a considerable benefit to CLTE.

Fence Strike. Fences placed in otherwise open habitat can be hazardous to flying birds. Shorebirds have been killed upon striking cable (symbolic) fences at other sites where such fencing has been installed (Page, Warriner, et al. 2002). Although there are no direct observations of CLTE striking the seasonal exclosure fencing or South Oso Flaco symbolic fence, injured juvenile CLTE have been found within or very near the Southern Exclosure in the past and a small number of dead juvenile/adult CLTE have been found near the seasonal exclosure fence; therefore, these birds might have been injured or killed due to striking the fence (CDPR 2014a).

CDPR places thick plastic fencing (orange silt construction fencing cut into approximately 1-foot sections) to the top of the seasonal exclosure fence to increase the visibility of the fence for flying CLTE. Use of the orange fencing was attempted as an experiment in 2015 and was placed on the western and northern Southern Exclosure (6 and 7 Exclosures and part of 8 Exclosure) fence from 2016 to 2023 with favorable results. CDPR will continue to implement this program by lining the top of the fence with the orange fencing in March of each year along most of the western and northern Southern Exclosure fenced areas. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip fencing. Therefore, the visible fencing is anticipated to reduce the likelihood of a CLTE striking a fence in areas where it is installed. As a result, this event will continue to be rare. Overall, the seasonal exclosure fence is an important protective measure that has increased CLTE reproductive success in the HCP area. Therefore, the seasonal exclosure fence will continue to be used despite the potential for birds to strike the fence.

The exclosure fence and other fencing are intended to protect the nesting area from public entry and to protect breeding areas from certain predators. While the installation, removal, and hand maintenance of the exclosure fencing is considered a recovery activity under the USFWS Recovery Permit, injury, mortality, or other incidental take from fence strikes will be covered by this HCP and not through permit TE-815214-10.

Single-Nest Exclosures

Nesting Disturbance. Single-nest exclosures are installed and maintained in the HCP area as part of the ongoing SNPL and CLTE management program. Only large single-nest exclosures are erected around CLTE nests (section 2.2.2.1.1). Installation of CLTE single-nest exclosures can be highly disruptive to CLTE as adults are often displaced from incubation for the duration of the exclosure construction. Burton (R. K. Burton 1996) found that when exclosures were built around CLTE nests where adults were incubating full clutches, the adults rarely left the vicinity during exclosure installation and they returned to the nest before fence construction was completed. In the HCP area, CLTE begin incubating after the first egg is laid. Also, given the greater risk to the nest from recreationists in the open riding area, it is not possible to wait for a complete clutch, and therefore single-nest exclosures are installed as soon as feasible once a nest is discovered in the open riding area. Additional AMMs that are implemented as part of the ongoing SNPL and CLTE management program that will continue to be implemented include having only USFWS-approved biologists/Natural Resource staff oversee the install of the exclosure; timing the installation of the exclosure to avoid extremely windy periods; minimizing time spent installing the exclosures as much as possible; and monitoring the nest after exclosure installation to ensure that the adult returns. Overall, single-nest exclosures are beneficial and appear to protect nests from the impacts of recreation and/or predation.

Single-nest exclosures are intended to protect individual nests from public entry and from certain predators. While the installation of single-nest exclosures is considered a recovery activity under the USFWS Recovery Permit, injury, mortality, or other forms of incidental take from fence strikes will be covered by this HCP and not through permit TE-815214-10.

Increased Predators. Single-nest exclosures can also pose a risk to incubating adult CLTE because they may increase the likelihood that predators key in on the exclosure and prey on the attending adults. Although this has been observed to occur on SNPL nests with small single-nest exclosures or mini exclosures in the HCP area, these types of exclosures are not used for CLTE. Predators could still key in on large single-nest exclosures. To minimize this impact, CDPR implements a predator management program that will control avian and/or mammalian predators if they are observed targeting or disturbing CLTE within single-nest exclosures. Therefore, this effect is considered to be minimal.

Single-nest exclosures are intended to protect individual nests from public entry and from certain predators. Impacts to adults, juveniles, chicks and eggs from these single-nest exclosures from increased predation or nest abandonment will continue to be authorized under the USFWS Recovery Permit TE-815214-10.

Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Monitoring

Vehicle Strike. Although almost all CLTE nests in the HCP area between 2005 and 2023 have been found within the Southern Exclosure, some CLTE may nest outside the exclosure. While driving to access the Southern Exclosure, monitors or their vehicles can crush a chick or nest that lies outside the exclosure if a CLTE nest has been established there but not yet discovered. To reduce this risk, monitors in the HCP area follow established protocols to minimize adverse effects on nesting CLTE, including, but not limited

to, keeping speeds below 5 mph along the exclosure shoreline and scanning ahead of the vehicle for CLTE. Monitoring on the exclosure shoreline is conducted by experienced monitors who are authorized by the USFWS to conduct the monitoring and/or who work under the specific requirements of the 10(a)(1)(A) Recovery Permit so it is less likely that there will be impacts to nests or chicks. Monitors will continue to follow established protocols when conducting monitoring activities. Therefore, impact from vehicle strike is not likely to occur.

Nesting Impacts. Monitoring of CLTE has been conducted in the HCP area since 1991, although the methods have been modified over the years to ensure the monitoring is effective. Monitoring activities involve extended or repeated visits to CLTE nesting sites, which can disrupt nesting birds by keeping them off their nest, separating chicks from adults, displacing chicks into the open riding area, and exposing eggs to inclement weather and predators. In addition, the practice of floating CLTE eggs to estimate hatch date could damage the eggs themselves and disturb attending adults at the nest. Investigator disturbance has been shown to lower reproductive success of colonial nesting birds (Burger 1981) (Carney and Sydeman 1999). Two additional studies reported that the negative influences of investigators on ring-billed gulls (*Larus delawarensis*), a colonial nesting bird, were nearly eliminated when careful measures were taken (Fetterolf 1981) (Brown and Morris 1994) (Brown and Morris 1995). Within the HCP area, CDPR staff implements established protocols during monitoring to minimize adverse effects of monitors on nesting CLTE. In addition, staff entering the Southern Exclosure to monitor nests or broods must either have a 10(a)(1)(A) Recovery Permit or be approved by the USFWS. Overall, monitoring of nests, when carried out by experienced and permitted biologists, as is done in the HCP area, benefits CLTE by tracking nest fate and identifying threats to breeding birds, providing information that is critical to the conservation and protection of the species.

Within the HCP area, cameras are sometimes installed at CLTE nests to document nest predators. While they collect useful data on nesting, cameras that are used to monitor nests need to be maintained, which can cause additional disturbance when the monitors approach the cameras to maintain them. In addition, the cameras may be spotted by potential CLTE predators and alert these predators to the location of nearby nests. However, in other studies that used cameras to monitor shorebird nests, the presence of cameras did not appear to influence nesting success or attract predators to the nest (Brown, Jansen and Innes 1998) (Demers and Robinson-Nilsen 2012). Cameras have not been observed influencing nest success in the HCP area to date. To ensure effects from cameras are minimized, CDPR will also continue to implement the SNPL and CLTE management program, which includes AMMs that should be implemented while using still or video cameras, such as training monitors on how to install cameras, not installing cameras when the wind speed is above 15 mph or strong enough to move sand or if it is raining, waiting to deploy cameras if a predator sighting recently occurred, and not installing cameras on nests that are readily visible to the public. As a result, the effects of using cameras near CLTE nests are considered to be minimal.

Any impacts from monitoring CLTE will continue to be authorized under Recovery Permit TE-815214-10.

Banding

Adult Impacts. Adult CLTE in the HCP area are not currently captured to be banded and this will not occur in the future.

Chick Impacts. Leg bands are used to mark CLTE chicks within the HCP area. Banding CLTE chicks results in capture of the chicks and can lead to injury or death; however, this has not been documented in the HCP area to date. To minimize the risk of injury or mortality during banding activities, CDPR implements established protocols associated with the SNPL and CLTE management program. Specifically, CDPR uses appointed staff that have obtained the appropriate state and federal permits to band a large portion of

the hatched CLTE chicks within the HCP area each breeding season. As a result, injuries or mortality associated with banding are expected to be rare (if any) in the future.

Banding activities typically require appointed permitted staff to enter the Southern Exclosure and/or remain in an area for a prolonged period of time to band the chicks. Effects of banding activities are expected to be similar to the effects of monitoring activities (section 4.3.1.2.1) and could result in disrupting nesting birds by keeping them off their nest, separating chicks from adults, displacing or moving chicks into the open riding area, and exposing birds to predators. In order to reduce effects on CLTE, CDPR implements established protocols as part of the SNPL and CLTE management program. Specifically, only staff with appropriate state and federal permits, and those with a 10(a)(1)(A) Recovery Permit or approved by the USFWS conduct banding activities. Banders are also provided with information on CLTE in the HCP area and are made aware of the location of nests, chicks, and adults in order to minimize situations where a chick or incubating adult are disturbed. Monitors also observe the open riding area during any activities that can result in chicks leaving the protection of the exclosure to ensure no chicks flush into the open riding area during activities. If chicks move into the open riding area, monitors control traffic and ensure the chicks move safely back into the Southern Exclosure. As a result, disturbance of CLTE related to banding activities are considered to be minimal.

Any impacts from banding CLTE will continue to be authorized under Recovery Permit TE-815214-10.

Predator Control

Nesting Impacts. Avian and mammalian predation has been recognized as a severely limiting factor to the CLTE's recovery (Massey 1988, USFWS 1988). A predator management program has been implemented in the HCP area since 2002 as part of the ongoing SNPL and CLTE management program. Control of both avian and mammalian predators (including removal) has been shown to increase chick survival in shorebirds (Neuman, Page and Stenzel, et al. 2004, Catlin, Felio and Fraser 2011). However, control of both avian and mammalian predators (e.g., hazing, live trapping, or lethal removal) can result in negative effects on CLTE. Predator removal may require a predator specialist to enter the Southern Exclosure and/or remain in an area for a prolonged period of time to set and monitor predator traps.

Effects of predator management activities are similar to the effects of monitoring activities (section 4.3.1.2.1) and can result in disrupting nesting birds by keeping them off their nests, separating chicks from adults, displacing or moving chicks into the open riding area, and exposing birds to predators. In order to reduce effects on CLTE, CDPR implements established protocols as part of the SNPL and CLTE management program. Specifically, predator specialists that enter the Southern Exclosure are either accompanied by a qualified biologist/Natural Resource staff or are approved by the USFWS to enter the nesting area. Predator specialists also consult with CDPR monitors prior to entering the Southern Exclosure, are provided with information on CLTE in the HCP area, and are made aware of the location of nests, chicks, and adults in order to determine allowable trapping locations that will minimize situations where a chick or incubating adult could be disturbed. Monitors also observe the open riding area during any activities that can result in chicks leaving the protected exclosure to ensure no chicks flush into the open riding area during activities. If chicks move into the open riding area, monitors control traffic and ensure the chicks move safely back into the non-vehicle use area. In addition, studies of CLTE colonies in California indicate predator management has been successful at increasing CLTE reproductive success (Butchko 1990, Butchko and Small 1992). Therefore, predator management will continue to benefit breeding CLTE in the HCP area.

Any impacts from predator control activities will continue to be authorized under Recovery Permit TE-815214-10.

Habitat Enhancement

Nesting Disturbance. Habitat enhancement has been implemented each year in the HCP area as part of the ongoing SNPL and CLTE management program. Transporting and installing the materials used for habitat enhancement measures (e.g., enhancing wrack, adding driftwood and woodchips) occurs in the Southern Exclosure prior to the start of the breeding season before CLTE arrive and/or at the end of the breeding season when CLTE are no longer nesting. Therefore, with the exception of the following, habitat enhancement activities do not affect CLTE.

A limited amount of habitat enhancement activities occurs on the Southern Exclosure shoreline (e.g., collecting and depositing wrack and beach hoppers/talitrids) during the breeding season. The effects are similar to the effects of monitoring activities (section 4.3.1.2.1) and can result in disrupting nesting birds by keeping them off their nest, separating chicks from adults, and/or exposing birds to predators. The majority of CLTE nests are found within the seasonal exclosure fence of 6 and 7 Exclosures, but some nests have been found on the exclosure shoreline in the past. To reduce impacts to CLTE, CDPR staff implements established protocols during habitat enhancement activities to minimize adverse effects of monitors on nesting CLTE. Specifically, monitors are aware of the location of CLTE nests, chicks, and adults in order to minimize situations where chicks or incubating adults are disturbed. In addition, only monitors approved by the USFWS or with a 10(a)(1)(A) Recovery Permit are permitted to collect or deposit materials on the exclosure shoreline. Overall, habitat enhancement has had a positive effect on CLTE by providing cover and other habitat improvements within breeding habitat. Therefore, habitat enhancement will continue to have an overall positive effect on CLTE.

Any impacts from habitat enhancement like seeds, wrack, woody debris, and protective cover will continue to be authorized under Recovery Permit TE-815214-10. More intensive habitat manipulation necessary to address areas where nesting has reduced in the Southern Exclosure would only be conducted once CLTE are not on site and would thus not negatively affect CLTE.

Tidewater Goby and Salmonid Surveys (CA-13)

Nesting Disturbance. One CLTE nest was observed in the HCP area near Arroyo Grande Creek where tidewater goby surveys occur; however, this last occurred in 2005. As a result, tidewater goby and salmonid surveys do not occur in locations where CLTE typically are known to nest and impacts to nesting CLTE are unlikely to occur.

Foraging and/or Roosting Disturbance. Tidewater goby and salmonid surveys occur during the CLTE breeding season at Oso Flaco Creek, including the lagoon-like reach (if present); Oso Flaco Lake; Arroyo Grande Creek and lagoon; or Pismo Creek and lagoon where CLTE are known to forage. If CLTE are foraging in these areas during surveys, then surveys can result in disturbance to foraging and/or roosting CLTE. Specifically, surveys can disturb CLTE adults and fledglings and deter them from foraging in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. Given that the surveys are short in duration and infrequent (i.e., conducted about four times in a year), the likelihood of these surveys affecting CLTE is low. In addition, CDPR will continue to implement the SNPL and CLTE management program within the HCP area. Daily monitoring during the breeding season will continue to include areas where fisheries survey will occur, and fisheries surveys will continue to be adjusted if daily surveys determine CLTE will be affected. Fisheries survey staff include personnel experienced with conducting fisheries surveys within CLTE habitat and may include permitted CLTE monitors, if deemed necessary. Surveys will be delayed if CLTE are observed foraging and/or roosting in the area and may be impacted by survey activities. These surveys have thus had minimal to no effect on CLTE in the past, and effects on CLTE will continue to be minimal. Tidewater goby salvage would not be conducted if it posed a disturbance risk to CLTE foraging or roosting.

Monitoring and Management for Listed Herpetological Resources (CA-14)

Nesting Disturbance. One CLTE nest has been observed in the HCP area near Arroyo Grande Creek where CRLF surveys occur; however, this last occurred in 2005. As a result, herpetological surveys do not occur in locations where CLTE are typically known to nest, and impacts to nesting CLTE are unlikely to occur.

Foraging and/or Roosting Disturbance. Herpetological surveys conducted within Oso Flaco Lake or the lagoons in the HCP area can temporarily disturb foraging and/or roosting CLTE. Such surveys can disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. CDPR will continue to implement the SNPL and CLTE management program within the HCP area to ensure these impacts are reduced. Specifically, surveys are not conducted if CLTE are observed foraging and roosting in the area and could be impacted by survey activities. In addition, the surveys are typically short in duration and infrequent. As a result, any disturbance to foraging and/or roosting CLTE from herpetological surveys are considered to be minimal.

Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Nesting Impacts. Monitoring for most listed plant species is conducted outside of the CLTE breeding season and/or habitat. Therefore, with the exception of the following listed plant monitoring activities, which occur in the breeding season, these activities have no effect on CLTE.

Surf thistle and beach spectaclepod are known to occur in North Oso Flaco Exclosure and South Oso Flaco within potential CLTE breeding habitat, including within the seasonal exclosure and symbolically fenced areas (Map 21 and Map 22). Because of the timing of their blooming and growth periods, both plant species can only be accurately identified by doing surveys during the CLTE breeding season. To date, CLTE have not been observed nesting in North Oso Flaco Exclosure or South Oso Flaco; therefore, impacts to nesting CLTE have not occurred during these surveys and are not expected. Seed collection for propagation would not be completed within areas occupied by breeding CLTE, and any planting would be done outside the breeding season.

Since potentially suitable breeding habitat (i.e., primary habitat) for CLTE is present in North and South Oso Flaco, although unlikely, it is possible that CLTE could nest within this area in the future. Because the blooming and growth periods for surf thistle and beach spectaclepod occur during the CLTE breeding season, these surveys could temporarily disturb any future CLTE nesting in North Oso Flaco Exclosure and South Oso Flaco in a similar manner as described for monitoring activities (section 4.3.1.2.1). However, since conducting surveys for these plant species requires entry into the nesting areas, the Oceano Dunes District has established detailed survey protocols in the Nesting Season Management Plan[61] (Appendix E), which is part of the ongoing SNPL and CLTE management program, to minimize effects on nesting CLTE. As a result, surveys conducted for surf thistle and beach spectaclepod during the breeding season are not expected to affect any CLTE that may nest in North or South Oso Falco in the future.

4.4.1.2.2 Habitat Restoration Program (CA-16)

Nesting Impacts. Any planting of foredune plants and seeds within or around the Southern Exclosure occurs prior to March, which is before CLTE arrive in the HCP area. Other habitat restoration and related

[61] The Nesting Season Management Plan will be superseded by this HCP in the future and will, therefore, no longer be required.

activities, including fence maintenance, occur prior to CLTE breeding season to the extent feasible. If activities occur in the breeding season, they are planned to avoid areas where CLTE are known to nest. CalVTP and dune slack restoration activities will not occur in areas utilized by nesting CLTE. As a result, no impacts to nesting CLTE occur.

Reduced Habitat. If vegetation for restoration purposes is planted in and grows too densely within the footprint of the Southern Exclosure or other primary and/or secondary suitable CLTE nesting habitat, it can reduce CLTE breeding habitat in these areas.[62] To reduce this impact, vegetation associated with the habitat restoration program is not planted beyond existing vegetated islands and will avoid areas where CLTE are known to nest. Therefore, impacts to CLTE breeding habitat are unlikely.

Increased Predators. Vegetation that is planted in the vicinity of known CLTE nesting and/or roosting habitat can impact CLTE by providing habitat for predators to hide and stalk nesting and/or roosting CLTE. To reduce this impact, CDPR implements a predator management program that has been successful at controlling predators in the HCP area and protecting breeding CLTE. The predator management program has likely increased reproductive success for CLTE and is expected to alleviate impacts associated with any additional vegetation being planted near CLTE habitat. As a result, these effects are very minimal.

4.4.1.2.3 Invasive Plant and Animal Control (CA-17)

Nesting Impacts. Actions taken to control invasive plants do not occur near the Southern Exclosure during the breeding season. In addition, any control of invasive plants during the breeding season avoid areas where CLTE are known to nest. Therefore, effects on nesting CLTE do not occur.

Foraging and/or Roosting Disturbance. Invasive plant or animal control may occur in areas that can disturb roosting or foraging CLTE, especially near water bodies in the HCP area (e.g., Pismo Creek Lagoon, Arroyo Grande Creek and Estuary). Invasive plant and animal control can disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. To reduce impacts from invasive plant or animal control, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, qualified biologists/Natural Resource staff or CDPR approved contractors conducting the work will continue to be aware of CLTE activity and will adjust timing and location of the control actions to avoid any disturbance to foraging CLTE. As a result, effects on foraging and/or roosting CLTE is considered to be very minimal. In addition, invasive plants have been shown to prevent CLTE from nesting in otherwise suitable areas (Wiedemann 1984, Muir and Colwell 2010); therefore, removal of invasive plants ultimately improves native habitats and potentially increases available CLTE habitat in the HCP area.

4.4.1.2.4 Wildlife Habitat Protection Plan Implementation (CA-18)

The effects of the CLTE and SNPL, CRLF, tidewater goby, and plant monitoring programs, which are part of the WHPP, are described in the previous section (i.e., section 4.3.1.2.1).

Nesting Impacts. The effects of other components of the WHPP (e.g., vegetation monitoring, terrestrial bird monitoring, reptile and amphibian monitoring, small mammal monitoring, and large mammal monitoring) are limited because most WHPP monitoring that needs to be conducted in CLTE breeding

[62] Installing plants at the start of the CLTE breeding season specifically to enhance breeding habitat is a separate action from habitat restoration (section 4.3.1.2.2).

habitat is implemented outside the breeding season or in areas where CLTE are not likely to nest. WHPP activities that need to occur within the breeding season are described below.

Terrestrial bird monitoring occurs during the breeding season and small mammal monitoring may occur during the breeding season, with all surveys located within CLTE secondary habitat. From 2005 through 2023, only three CLTE nests were discovered in secondary habitat. Therefore, it is unlikely that any nests will occur near terrestrial bird and small mammal monitoring plots in the future. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. Any nests that are found in the open riding area will be protected by a large single-nest exclosure with a minimum 330-foot buffer, if appropriate. In addition, additional fencing (i.e., bumpout) will be installed to enlarge the Southern Exclosure if necessary, to provide a 330-foot buffer from the nest to the open riding area, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. Therefore, effects from terrestrial bird and small mammal monitoring will continue to be minimal.

During the breeding season, monitors conduct three surveys for shorebirds along the shoreline of the HCP area, including within the Southern Exclosure shoreline. These surveys can disturb nesting or brooding CLTE. As a result, the WHPP monitoring surveys within or near the Southern Exclosure are conducted by monitors with a 10(a)(1)(A) Recovery Permit (or approved by USFWS). Therefore, disturbance caused by these surveys results in the same effects as those described for CLTE monitoring (section 4.3.1.2.1) and are considered to be minimal.

4.4.1.2.5 Water Quality Monitoring Projects (CA-19)

Nesting, Foraging, and/or Roosting Disturbance. Installation of water quality monitoring equipment occurs outside the CLTE breeding season; therefore, any future installation activities will not affect CLTE.

Water quality monitoring equipment is currently installed at Oso Flaco Lake. Water quality monitoring equipment may be installed in other aquatic habitat in the HCP area in the future. Maintenance and/or installation of water quality monitoring equipment at Oso Flaco Creek, Pismo Creek, Arroyo Grande Creek, and associated estuaries will be timed to avoid the CLTE breeding season, to the extent feasible. However, some maintenance of water quality equipment may need to occur during the breeding season. Water quality maintenance does not occur in areas where CLTE typically nest; therefore, these activities are not expected to affect nesting CLTE. Depending on the areas being accessed for water quality monitoring during the breeding season, minor disturbance of foraging and/or roosting CLTE could occur. Specifically, maintenance of equipment could disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish could become energetically stressed if they are unable to forage normally. However, these effects are expected to be minimal given the short duration and minimal equipment requirements required to maintain the monitoring device. In addition, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which includes delaying work if a CLTE is observed foraging and/or roosting in the area and could be disturbed by activities. As a result, effects on nesting, foraging, and roosting CLTE will be very minimal.

4.4.1.3 Park Maintenance

4.4.1.3.1 Campground Maintenance (CA-20)

Campground maintenance activities do not affect CLTE since the designated campgrounds are not considered CLTE breeding or foraging habitat.

4.4.1.3.2 General Facilities Maintenance (CA-21)

Existing general maintenance activities do not occur within the Southern Exclosure;[63] therefore, direct effects on CLTE nests within the exclosure do not occur. General maintenance activities that can affect CLTE include litter pick-up, facility repairs, and restroom and signpost maintenance when these activities are located near CLTE primary and/or secondary nesting and/or foraging habitat.

Mechanical trash removal will not occur within vegetated areas or within any fenced closed areas where known CLTE nesting occurs (such as the Southern Exclosure) during the breeding or non-breeding season; therefore, direct effects on CLTE nests within the exclosure will not occur. Mechanical trash removal will not occur near any creeks and lagoons; therefore, impacts to foraging CLTE are not expected.

Vehicle Strike. Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest in primary and/or secondary habitat outside the exclosure. In the HCP area in the past, this has been an infrequent occurrence. A general maintenance vehicle can crush eggs or chicks in an active CLTE nest that is outside the Southern Exclosure and not yet identified by monitors. To reduce the potential for vehicle strike, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. In addition, any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure will be installed as soon as possible, thus reducing the likelihood of vehicle strike (section 5.3.1). Prior to hatch, silt fencing or small mesh chick fencing will be installed within the exclosure or attached to the lower portion of the exclosure fence to prevent CLTE chicks from traveling into the open riding area. As a result, these impacts will continue to be minimal.

Maintenance vehicles can also strike a roosting adult or chick within other closed nesting areas outside, but adjacent to the seasonal exclosure. To reduce the risk of a maintenance vehicle striking a CLTE adult or chick, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to escort maintenance workers within areas closed for nesting (e.g. Southern Exclosure shoreline or within bumpout areas) to reduce the risk of a vehicle striking a roosting adult or chick. As a result, this impact is considered to be minimal.

Nesting Disturbance. If maintenance activities, including mechanical trash removal, are conducted adjacent to the Southern Exclosure within the open riding area, they can disturb nesting and/or roosting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys will continue to be conducted in areas where CLTE occur prior to maintenance activities to ascertain the presence of CLTE. If CLTE are observed, maintenance activities will be delayed until an experienced monitor determines that CLTE will not be impacted. In addition, monitors will continue to escort maintenance workers driving on the Southern Exclosure shoreline or within bumpouts, to ensure disturbance to roosting and nesting CLTE is minimized. Further, mechanical trash removal is designed to avoid areas where CLTE are known to nest and will not occur within the 330-foot nest buffer area to prevent any disturbance to CLTE. As a result, effects to CLTE from maintenance activities near the Southern Exclosure are considered to be minimal.

[63] Effects associated with maintenance of the seasonal exclosure are discussed in section 4.3.1.2.1.

Restroom facilities need to be maintained regularly during the breeding season. No restrooms are located within or near the Southern Exclosure where almost all CLTE nest are located. Some restrooms are located within CLTE primary and/or secondary habitat, and others are within tertiary habitat. CLTE have never been found nesting in tertiary habitat; therefore, impacts to CLTE in tertiary habitat are not known to occur. CLTE have rarely been found nesting within secondary habitat (e.g., three nests were found in secondary habitat between 2005 and 2023), and almost all of the CLTE nests in primary habitat are located within the Southern Exclosure (Map 11); therefore, restroom facilities are unlikely to impact CLTE nests. However, impacts to CLTE nests within primary and secondary habitat outside the Southern Exclosure could occur in the rare case when a CLTE nests outside the exclosure in the future. In order to minimize these impacts, the District implements established protocol if CLTE establish a nest within 330 feet of these structures to ensure that restroom maintenance and public access at the restrooms do not disturb breeding CLTE. Specifically, permanent restroom buildings are closed to public use and the large single-nest exclosure fencing is erected around the restroom to isolate it and prevent public use. In addition, chemical toilets are relocated to a minimum of 330 feet from any nest site, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. Therefore, the effect on CLTE from maintaining restroom structures is minimal.

Foraging and/or Roosting Disturbance. Foraging and/or roosting CLTE can be disturbed by maintenance activities within foraging or roosting habitat, such as Oso Flaco Lake. Specifically, general maintenance activities can disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. Maintenance activities have minimal effects on foraging and/or roosting CLTE because maintenance activities are generally accomplished quickly. In addition, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to be aware of CLTE activity and will adjust the timing and/or location of general maintenance activities to avoid foraging and/or roosting CLTE. As a result, effects from activities near foraging and/or roosting CLTE are considered to be minimal.

Reduced Habitat. The placement of restroom facilities within CLTE breeding habitat reduces the amount of habitat available to CLTE for breeding by precluding them from nesting within the footprint of the structures. However, restroom facilities are small (i.e., approximately 8 feet by 8 feet) and they are placed in areas where CLTE do not typically nest (i.e., outside the Southern Exclosure). Therefore, this effect is minimal.

Mechanical trash removal will not be conducted within vegetated areas or within any fenced closed areas where known CLTE nesting occurs (such as near the Southern Exclosure) during the breeding or non-breeding season; therefore, CLTE habitat will not be affected. In addition, mechanical trash removal will not occur near lakes or other water bodies; therefore, CLTE foraging habitat will not be impacted. Mechanical trash removal could affect favorable CLTE nesting habitat (i.e., primary and secondary habitat) by altering dune composition and topography. Specifically, mechanical trash removal could reduce organic surface materials (e.g., driftwood) and microtopography. Most mechanical trash removal will be conducted to remove litter in areas where recreation activities have been concentrated. These areas are unlikely to support the appropriate nesting habitat for CLTE due to the high level of recreation; therefore, CLTE are not expected to nest in the areas where mechanical trash removal will typically occur. As a result, this effect will be minimal.

4.4.1.3.3 Trash Control (CA-22)

Installation and maintenance of small trash bins in the non-motorized portion of Pismo State Beach does not affect CLTE since the trash bins are installed near the parking areas and access points, which are outside of suitable nesting and foraging habitat for CLTE.

Nesting Impacts. Because most of the large trash dumpsters are located in the dunes, approximately 2 miles from the 6 Exclosure, vehicle strike and disturbance of nesting CLTE is unlikely when visitors or maintenance staff access the dumpsters. However, some large trash dumpsters near Post 2 are located within an area mapped as primary CLTE breeding habitat. Although CLTE have not nested in this area in the past, if a nest were established near the dumpsters, activity could crush a nest that has not been discovered by monitors or disturb nearby nesting and/or roosting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult.

Once the adults leave the nests or chicks, eggs could be buried by sand, depredated, or inadequately incubated and chicks could be depredated, inadequately fed, or flushed into the open riding area. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which requires that the location of the trash dumpster near Post 2 be changed, as necessary, to avoid disturbance to any nearby active CLTE nests. Monitors will also continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure will be installed as soon as possible (section 5.3.1). As a result, this effect is considered to be minimal.

Foraging and Roosting Disturbance. Although infrequent, some garbage pick-up, including volunteer beach cleanup and cleanup on the beach after a storm, is required in the HCP area. These activities are conducted outside of the CLTE breeding season to the extent feasible. If activities occur during the breeding season (e.g., after a storm event) they are planned to avoid active CLTE nesting areas. Where cleanups do occur during the breeding season, they are typically completed on foot with handheld trash bags and can cause similar disturbance of foraging and/or roosting CLTE as general maintenance activities (section 4.4.1.3.2). To reduce any impacts from volunteer cleanup, CDPR implements the ongoing SNPL and CLTE management program, which includes ensuring all staff and volunteers that conduct beach cleanups will continue to be given a training on CLTE life history and conservation measures in the HCP area. In addition, if volunteer beach cleanup occurs during the breeding season it is typically scheduled to occur during times when most CLTE have left the HCP area. If volunteer cleanup occurs in areas where foraging and/or roosting CLTE could be impacted, a permitted (or USFWS approved) monitor is present during the activities to ensure no impacts occur. Effects from beach cleanup are minimal with the implementation of the SNPL and CLTE management program AMMs.

Increased Predators. Trash dumpsters attract a large number of gulls that land and forage in the dumpsters if they are left uncovered (CDPR 2014a). As a result, the use of uncovered trash dumpsters within or near CLTE areas where CLTE nest, forage, and/or roost can artificially increase the number of predatory species, including gulls, and thus increase depredation of CLTE. To date, CLTE have not nested, roosted, or foraged in the area where the trash dumpsters are located. Increasing the number of trash bins on holidays and during special events to accommodate the increased number of visitors can also artificially increase the number of predators at these times and increase depredation of CLTE. To minimize these impacts, CDPR has implemented options to limit the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. The most significant change is using a covered dumpster with openings on the side that has been found to attract fewer gulls than the previous open design. CDPR will also continue to implement the predator management program to ensure depredation of CLTE is minimized. The predator management program has likely contributed to the overall population (i.e., number of breeding adults) and reproductive success (i.e., number of fledglings per nesting pair) increase for CLTE in the HCP area. Curtailing predator presence near the dumpsters and reducing the movement of trash from the dumpsters will reduce the risk of predation on CLTE.

4.4.1.3.4 Wind Fencing Installation, Maintenance, and Removal (CA-23)

Nesting Impacts. CLTE rarely nest outside the Southern Exclosure. For example, a CLTE nests was found east of the Southern Exclosure in 2020 and a CLTE nest was found near the Arroyo Grande Lagoon in 2005. Therefore, wind fencing installation, maintenance, and/or removal has not affected and is not expected to affect CLTE in the future since it is located upwind of Grand Avenue, Pier Avenue, and Strand Way, which is not near the Southern Exclosure.

Although CLTE do not typically nest in the wind fencing areas upwind of Strand Way, Pier Avenue, and Grand Avenue, the wind fencing is located in an area mapped as secondary habitat for CLTE. Therefore, installation, maintenance, and/or removal of wind fencing in these areas could result in destruction or disturbance of a CLTE nest in the rare event that a CLTE establishes a nest that is outside the Southern Exclosure and has not yet been discovered by monitors. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. In addition, any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure. As a result, effects on CLTE from wind fencing installation, maintenance, and/or removal are considered unlikely.

Foraging and/or Roosting Impacts. Foraging and/or roosting CLTE are not known to be disturbed by wind fence installation, maintenance, and/or removal activities because these fences are not located near aquatic foraging habitat.

4.4.1.3.5 Sand Ramp and Other Vehicular Access Maintenance (CA-24)

Nesting and Foraging Impacts. CLTE are not known or expected to nest near the sand ramps. To ensure that breeding CLTE are not affected, CDPR will continue to conduct surveys of the sand ramps once per day as part of the daily transects associated with the SNPL and CLTE management program. In addition, sand ramp maintenance activities will be postponed if any nests are found. Therefore, impacts to breeding CLTE from sand ramp maintenance are avoided.

Other vehicular access maintenance activities (e.g., maintenance of parking areas, the Grand Dunes Trail, and access corridors at Oso Flaco Lake) are outside of CLTE breeding and foraging habitat, and maintenance do not affect the species.

4.4.1.3.6 Street Sweeping (CA-25)

Street sweeping activities do not affect CLTE since the Grand and Pier Avenue entrance stations are not located within or near CLTE habitat.

4.4.1.3.7 Routine Riparian Maintenance (CA-26)

Nesting Impacts. Routine riparian maintenance activities are not conducted in suitable CLTE nesting habitat; therefore, these activities do not affect nesting CLTE.

Foraging and/or Roosting Impacts. The Pismo Lake spillway and the two culverts at Oso Flaco Lake are maintained as needed. CLTE are known to forage and/or roost adjacent to riparian maintenance areas in open water habitats including Pismo Lake and Oso Flaco Lake. Maintenance typically entails CDPR staff manually or, if needed, mechanically removing vegetation, debris, and sediment build-up above the natural channel bed. Noise from equipment during culvert maintenance can temporarily disturb foraging CLTE and interfere with foraging activity if conducted during the CLTE breeding season. Routine riparian maintenance work in or adjacent to CLTE foraging habitat is implemented outside of the breeding season, when feasible. If maintenance activities must be conducted during the breeding season, disturbance to foraging CLTE is minimized by having a monitor present to observe CLTE

behavior. If the monitor determines that CLTE foraging nearby are disturbed, the maintenance work will be delayed until it is determined that no impacts will occur. As a result, the effects of these activities on CLTE are unlikely.

All tree trimming and invasive plant removal activities at Oso Flaco Lake occur between August 15 and March 1, which is largely outside the CLTE breeding season. If CLTE are present in Oso Flaco Lake, tree trimming and invasive plant removal can disturb foraging CLTE and interfere with foraging activities. To reduce this impact, a monitor is present to observe CLTE behavior during these activities. If the monitor determines that CLTE foraging nearby are disturbed, the monitor stops work until it is determined that no impacts will occur. As a result, tree trimming and invasive removal have only minimal effects, if any, on foraging CLTE.

4.4.1.3.8 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

Nesting Impacts. Almost all of the CLTE breeding population in the HCP area nest within the Southern Exclosure. Perimeter fence and vegetation island fence installation, maintenance, and removal does not occur within the Southern Exclosure. As a result, the nests within the Southern Exclosure are not directly impacted by perimeter fence installation, maintenance, and/or removal.

Perimeter fencing delineates the riding area from other areas within the HCP area. Most perimeter fencing occurs within tertiary habitat and does not affect CLTE, although some limited perimeter fencing does occur within primary and secondary habitat. Vegetation island fencing is placed around vegetation islands and occurs within primary, secondary, and tertiary habitat. CLTE are not affected by vegetation island fencing in tertiary habitat.

A limited amount of perimeter and vegetation island fencing occurs directly adjacent to the Southern Exclosure (e.g., Pipeline vegetation island). Perimeter and vegetation island fence maintenance adjacent to the exclosure can disturb nesting CLTE within the exclosure (Map 5). To reduce this impact, CDPR will continue to delay maintenance activities for the perimeter and vegetation island fence adjacent to the Southern Exclosure until late September, when all CLTE nests are confirmed to be fledged. As a result, perimeter and vegetation island fence maintenance adjacent to the exclosure does not affect nesting CLTE.

Although CLTE do not typically nest outside the Southern Exclosure, some of the perimeter and vegetation island fencing is located in primary and/or secondary breeding habitat for CLTE. Therefore, installation, maintenance, and/or removal of the fencing in these areas could result in destruction or disturbance of a CLTE nest in the rare event that a CLTE establishes a nest outside the Southern Exclosure and it has not yet been discovered by monitors. To reduce the potential impacts to nests outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the exclosure. Any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure. In addition, any perimeter or vegetation island fence work will be delayed if CLTE are observed in the area. Therefore, the effect on CLTE from these activities is considered to be very minimal.

Foraging and/or Roosting Impacts. Foraging and/or roosting CLTE are not disturbed by perimeter and vegetation island installation, maintenance, and/or removal activities because these fences are not located near aquatic foraging habitat.

4.4.1.3.9 Heavy Equipment Response (CA-29)

Vehicle Strike. Heavy equipment generally results in the same type of effects on CLTE as general facilities maintenance (section 4.4.1.3.2) and maintenance of the SNPL and CLTE protection fence (section 4.3.1.2.1). It may be necessary to use heavy equipment in CLTE primary and/or secondary breeding habitat, including for fence maintenance and deposition for habitat enhancement, as well as for unplanned reasons, such as burying of marine mammals and moving an abandoned boat.

Almost all of the CLTE breeding population in the HCP area nests within the Southern Exclosure. Heavy equipment response does not occur within the exclosure during the CLTE breeding season. As a result, most CLTE nests are not directly affected by heavy equipment operations since they are protected by the Southern Exclosure.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can infrequently nest outside the protection of the exclosure. Heavy equipment can crush eggs or chicks in an active CLTE nest that is in the open riding area and not yet identified by monitors. To reduce impacts to any CLTE nests outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. In addition, any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure will be installed as soon as possible (section 5.3.1), thus reducing the likelihood of vehicle strike. Prior to hatch, silt fencing or small mesh chick fencing will be installed within the exclosure or attached to the lower portion of the exclosure fence to prevent CLTE chicks from traveling into the open riding area. All heavy equipment operators will also continue to receive training that includes life history information, measures, and rules that should be implemented to protect CLTE, including keeping speeds at or below 15 mph in the riding area. In addition, if heavy equipment response is needed on the closed shoreline (e.g., south of Post 6), monitors will continue to escort heavy equipment along the shoreline and keep speeds at or below 5 mph to ensure disturbance to roosting and nesting CLTE is minimized. As a result, direct impacts to nesting or roosting CLTE outside the Southern Exclosure from heavy equipment will continue to be minimal.

Nesting Disturbance. If heavy equipment activities are conducted adjacent to the Southern Exclosure, they can disturb nesting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce disturbance to nesting CLTE associated with heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, heavy equipment activities will be delayed when CLTE are observed to be present. As a result, effects from activities near the Southern Exclosure are considered to be minimal.

Foraging and/or Roosting Disturbance. Heavy equipment can disturb and/or displace foraging and/or roosting CLTE adults and chicks if the equipment needs to stay in an area near aquatic foraging habitat for a prolonged period of time (e.g., when burying deceased marine life). During this time, CLTE adults and chicks can become energetically stressed by prolonged disturbance. Prolonged disturbance from heavy equipment can also reduce CLTE foraging times, and both chicks and adults can become malnourished. In addition, chicks can become separated from adults, which can leave them exposed to predators. To minimize impacts to foraging and/or roosting CLTE from heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, a survey will continue to be conducted for CLTE prior to using heavy equipment in areas that could affect roosting or foraging CLTE. If CLTE are observed, heavy equipment activities will be delayed until the

bird(s) has left the area. As a result, effects on foraging CLTE from using heavy equipment are considered to be minimal.

4.4.1.3.10 Minor Grading (CA-30)

The specific location and timing of minor grading changes from year to year. The effects of grading to maintain seasonal exclosure fencing are included in section 4.3.1.2.1, and the effects of grading to maintain the perimeter and vegetation island fence are included in section 4.4.1.3.8.

Other minor grading either is not conducted during the CLTE breeding season or is conducted in a manner and/or location that does not affect the species; therefore, CLTE are not affected by these activities.

4.4.1.3.11 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Work on boardwalks in Pismo State Beach and Oso Flaco Lake can be conducted in or adjacent to wetland and other aquatic habitat, which is considered suitable CLTE foraging habitat. Work on the boardwalks and other pedestrian access areas is conducted outside the CLTE breeding season, if possible. If activities are conducted in the breeding season, effects are similar to those discussed for general maintenance activities on foraging CLTE (section 4.4.1.3.2) and are very minimal.

4.4.1.4 Visitor Services

4.4.1.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

The potential threats posed by routine, non-emergency ranger and park staff patrols are similar to those described for general facilities maintenance (section 4.4.1.3.2) in that patrol vehicles drive along the beaches and dunes within posted speed limits (with the exception of emergency response [section 4.4.1.4.2]).

Vehicle Strike. Ranger and patrol vehicles do not enter the Southern Exclosure during routine, non-emergency situations, without an escort by a USFWS-approved monitor or without training by a USFWS-approved monitor; therefore, impacts to nesting CLTE are considered to be minimal.

Lifeguard towers are not placed within habitat used by CLTE for nesting; therefore, no impacts to nesting CLTE occur from lifeguard tower activities.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE have infrequently nested outside the protection of the exclosure. For example, a CLTE nests was found east of the Southern Exclosure in 2020 and a CLTE nest was found near the Arroyo Grande Lagoon in 2005. Non-emergency ranger and patrol vehicles can crush eggs or chicks in an active CLTE nest that in the open riding area and not yet identified by monitors. To reduce impacts to any CLTE nests outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. Any nests found in the open riding area will be protected by a large single-nest exclosure (section 5.3.1), thus reducing the likelihood of a routine, non-emergency ranger and/or park staff patrol destroying or disturbing a nest. As a result, direct impacts to nesting CLTE outside the Southern Exclosure will continue to be minimal.

Nesting Disturbance. As with general maintenance activities, disturbance to nesting CLTE from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location, as well as the distance between most patrol activities and the Southern Exclosure. The occasional stuck vehicle or traffic stop near a CLTE nest can cause disturbance to CLTE since the activity takes longer time to complete. During this time, CLTE adults and chicks can become energetically stressed by prolonged disturbance. In addition, CLTE chicks can become separated from adults, which can leave them exposed

to predators and/or inclement weather. To reduce disturbance to nesting CLTE, CDPR will continue to implement the SNPL and CLTE management program, including providing a buffer of 330 feet, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, be used to protect CLTE nests within the HCP area. Bumpouts will also be installed for nests within the Southern Exclosure and adjacent to riding or camping areas. The bumpouts are monitored regularly, and if an incubating bird is disturbed by vehicle, the buffer area is increased in size as needed. As a result, these impacts are considered to be minimal.

Foraging and/or Roosting Impacts. Vehicles do not disturb or strike foraging CLTE since CLTE forage over water.

Non-emergency ranger and patrol vehicles generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of roosting CLTE can occur when these activities are located near occupied CLTE roosting habitat. In addition, vehicle strikes of roosting CLTE adults, juveniles, or chicks can occur if vehicles travel directly through habitat where CLTE are located during the breeding season. However, CLTE infrequently roost in areas open to public vehicles, and as with general maintenance activities, disturbance of CLTE from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location and the buffer between most patrol activities and the Southern Exclosure. In addition, during normal ranger and lifeguard patrols, vehicles travel at a speed no greater than 15 mph along the riding area shoreline to reduce the risk of a vehicle striking a roosting bird. Furthermore, as part of the ongoing SNPL and CLTE management program, all ranger and park staff receive a training on CLTE in the HCP area. As a result, these effects are considered minimal.

4.4.1.4.2 Emergency Response (CA-33)

Emergency medical and law enforcement responses by CDPR staff, which are important for maintaining human safety, can occur anywhere within the HCP area and are difficult to predict. Occasional, but necessary, high-speed travel by medical and law enforcement vehicles responding to an emergency sometimes occurs in areas without frequent vehicular traffic.

Emergency situations are infrequent in areas where CLTE typically nest, forage, or roost during the breeding season. However, emergency vehicles must respond to human safety issues and may need to enter areas occupied by breeding CLTE. Therefore, impacts to nesting, foraging, and roosting CLTE are discussed further below.

Nesting Impacts. If an emergency occurs within the Southern Exclosure or within a large single-nest exclosure/bumpout, it can be highly disruptive to CLTE as adults may flush from the nest and leave the eggs unattended for the duration of the disturbance. CLTE nests or chicks can be abandoned if the adult is injured, killed, or severely disturbed to the point it does not return to the eggs or chick. Chicks can also react to the disturbance by running away, and they may move into the open riding area or become separated from adults. Although emergency response can occur within the Southern Exclosure, such events are rare and do not occur in most years. Emergency response may be necessary within the CLTE buffer areas where the public is not allowed but CDPR staff occasionally access these areas (e.g. for installation, repair, or maintenance of fencing). Although very few nests have been found in the buffer area, one CLTE nest was found in 2020. To decrease impacts to CLTE, as part of the ongoing SNPL and CLTE management program in the HCP area, monitors inform emergency responders of the locations of sensitive areas and escort emergency response personnel into and out of the Southern Exclosure and bumpout fencing to minimize the potential for vehicle strike when feasible. Monitors also attempt to survey the area once the emergency situation has been resolved and cleared of emergency personnel in order to document and address, to the extent feasible, any impacts (e.g., missing or broken fencing) that occurred. Emergency vehicles have not been documented impacting CLTE within the Southern Exclosure

to date. As a result, effects on CLTE inside the Southern Exclosure are expected to continue to be minimal.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest outside the exclosure (e.g., near Arroyo Grande Creek, in the open riding area). Emergency vehicles can crush eggs or chicks in an active CLTE nest in the open riding area and not yet identified by monitors. To reduce impacts to any CLTE nests outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. In the unlikely event that a CLTE nest is found established in the open riding area, it will be protected by a large single-nest exclosure (section 5.3.1), thus reducing the likelihood of vehicle strike. In addition, emergency responders are informed of the locations of areas that are sensitive (e.g., exclosures, shoreline foraging areas), to the extent feasible, and signs will continue to be posted to mark these areas. USFWS-approved monitors will also continue to escort emergency vehicles into areas that are sensitive if the situation allows for this opportunity. As a result, direct impacts to nesting CLTE outside the Southern Exclosure due to emergency response will continue to be minimal.

Foraging and/or Roosting Impacts. CLTE forage over water and are thus not at risk of being struck by a speeding emergency vehicle while foraging. Most CLTE roost within an exclosure (e.g., 6 Exclosure, 7 Exclosure, large single-nest exclosure). Within the Southern Exlosure, CLTE are generally not at risk of being struck by a speeding emergency vehicle since response in these areas rarely occur. However, emergency response within a large single-nest exclosure/bumpout could cause vehicle strike to roosting CLTE, especially if response is when the night roost is present. In addition, CLTE that may roost in the riding area near lagoons or along the shoreline outside the seasonal exclosure fence can be struck by a speeding emergency vehicle. As part of the ongoing SNPL and CLTE management program, monitors attempt to minimize mortality and/or injury during an emergency response by escorting emergency vehicles into areas where CLTE roost, if the emergency situation allows. In addition, high speed travel by emergency vehicles within CLTE breeding habitat is rare. An emergency vehicle has not been observed striking a roosting CLTE in the HCP area to date; however, this event may be difficult to observe. Therefore, although unlikely, it is possible that a roosting CLTE could be struck by an emergency vehicle.

Emergency response activities can also disturb and/or deter foraging CLTE, although since CLTE forage over water, it is unlikely any land-based emergency response will disturb foraging CLTE to any significant degree. Some aquatic emergency response is required in the HCP area. However, these activities are typically localized, and adequate alternative foraging habitat is present in and adjacent to the HCP area. As a result, this impact is considered to be minimal.

4.4.1.4.3 Access by Non-CDPR Vehicles (CA-34)

In the past, vehicles driven by non-CDPR personnel including law enforcement agencies, salvage personnel, and marine mammal rescue responders, may have caused unpredictable disturbances, often involving multiple vehicles and unrestricted access to the shoreline. However, the District has enacted policies requiring non-park personnel to notify park staff when access to park lands is necessary. Non-park personnel that are granted vehicular access are informed of any restricted areas or other special conditions before entering the HCP area. Except in cases of extreme emergencies, this practice has eliminated resource damage and greatly reduced mortality, injury, and disturbance to CLTE.

Nesting Impacts. Effects from emergencies associated with non-CDPR vehicles are similar to those effects described in section 4.4.1.4.2, but CDPR is not always able to train non-CDPR responders. Therefore, some vehicle strikes may not be avoided if the emergency requires a non-CDPR vehicle to travel through areas where CLTE are present.

Medevac helicopters are also sometimes used in the HCP area during emergencies. Medevac helicopters flying low over or landing within occupied CLTE habitat can cause significant disturbance to nesting, roosting, and/or foraging CLTE. The noise from the helicopter may be highly disruptive to CLTE and the helicopter itself may be seen as a threat. Adults may flush from the nest and leave the eggs unattended and CLTE nests or chicks may be abandoned if the adult is disturbed enough it does not return to the nest or chicks. Chicks may be separated from adults and they may move into the open riding area where they become vulnerable to vehicle strike. In addition, helicopters may lead to increased vigilance in adults which may lead to them being energetically stressed or to reduced foraging. However, helicopter activity is an infrequent event in the HCP area, especially in areas where CLTE typically nest, forage, and/or roost; therefore, this impact is rarely (if ever) expected to occur. The following paragraphs detail effects from non-emergency activities.

Non-emergency non-CDPR vehicles do not enter the Southern Exclosure; therefore, impacts to CLTE nesting within the Southern Exclosure do not occur.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest outside the exclosure (e.g., near Arroyo Grande Creek and in the open riding area). Non-emergency non-CDPR vehicles may enter some of these areas. These vehicles driving through habitat occupied by CLTE can strike individual chicks or nests that are outside the protection of an exclosure and not yet identified by monitors. To reduce the potential to impact a CLTE nest in the open riding area, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure.

In the unlikely event a CLTE nest is found in the open riding area, it will be protected by a large single-nest exclosure (section 5.3.1), thus reducing the likelihood of a vehicle striking an incubating CLTE or crushing a nest and to ensure that non-emergency allied agencies working in the HCP area do not disturb the nesting bird. Prior to hatch, silt fencing or small mesh chick fencing will be installed within the exclosure or attached to the lower portion of the exclosure fence to prevent CLTE chicks from traveling into the open riding area and to ensure that allied agencies activities do not result in the loss of chicks. As a result, direct impacts to nesting CLTE outside the Southern Exclosure due to non-emergency non-CDPR vehicles will continue to be minimal.

Foraging and/or Roosting Impacts. Non-CDPR vehicles do not disturb or strike foraging CLTE since CLTE forage over water.

Non-emergency non-CDPR vehicles generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of roosting CLTE may occur when these activities are located near occupied CLTE roosting habitat. In addition, vehicle strikes of roosting CLTE adults, juveniles, or chicks can occur if vehicles travel directly through areas where CLTE are roosting. To reduce the potential for a vehicle striking a roosting CLTE during a non-emergency response, all vehicles must travel at a speed no greater than 15 mph. In addition, as part of the ongoing SNPL and CLTE management program, when possible, CDPR has a USFWS-approved monitor escort non-emergency non-CDPR vehicles into otherwise closed areas to minimize disturbance to CLTE in these areas. As a result, impacts to roosting CLTE from non-emergency non-CDPR vehicles are considered to be minimal.

4.4.1.4.4 Beach Concessions (CA-36)

Most concession services operate throughout the open riding area. The effects of concession services such as towing and wastewater pumping are similar to the effects of general facilities maintenance discussed in section 4.4.1.3.2. The effects of camper rentals are similar to the effects of other campers as discussed in section 4.4.1.1.2.

Nesting Impacts. The effects specific to OHV rentals are addressed in section 4.4.1.1.1. Although CLTE almost exclusively nest within the Southern Exclosure, CLTE have infrequently nested outside the protection of the exclosure and could continue to do so in the future. Although CLTE have never nested near the OHV rental location between Post 2 and 2.5 in the past, it is located in an area mapped as primary habitat and CLTE could potentially nest at this location. Visitors in vehicles traveling to the OHV rental location could crush eggs, chicks, or adults or disturb CLTE chicks or adults in an active CLTE nest that is in the riding area and not yet identified by monitors. To reduce the potential to impact a CLTE nest outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside the Southern Exclosure will be quickly protected with symbolic or wire fencing and a large single-nest exclosure will be installed as soon as possible (section 5.3.1), thus reducing the likelihood of a vehicle destroying or disturbing a nest and to ensure that visitors and rental activity do not disturb the nesting birds. As a result, direct impacts to nesting CLTE in the OHV rental area are unlikely.

Foraging and/or Roosting Impacts. CLTE may roost along the shoreline south of Grand Avenue, an area open to street-legal vehicles. Vehicles driving to or from concession services may strike individual CLTE or flush them from their location and cause them to become energetically stressed. To reduce the potential to disturb or strike a foraging or roosting CLTE, as part of the ongoing SNPL and CLTE management program in the HCP area, all concession service staff receive a focused training on CLTE life history and regulations, and all concession service vehicles are required to abide by park regulations and rules intended to protect CLTE (e.g., 15-mph speed limit on the portion of the beach open to the public). As a result, impacts from concessions is considered to be minimal.

4.4.1.4.5 Pismo State Beach Golf Course Operations (CA-37)

In over 20 years of observation, CLTE have not been recorded using the water features of the golf course to forage. Pismo State Beach Golf Course operations do not affect CLTE since the golf course is not located within or near CLTE breeding or foraging habitat.

4.4.1.4.6 Grover Beach Lodge and Conference Center (CA-38)

Grover Beach lodge and conference center will not affect CLTE since the lodge and the conference center are not located within or near CLTE breeding or foraging habitat.

4.4.1.4.7 Natural History and Interpretation Programs (CA-39)

Nesting Impacts. Trailers may be towed by CDPR staff to the beach to provide additional, impromptu, interpretive programs. These trailers are placed outside of actively used CLTE nesting, roosting, and foraging habitat. Therefore, effects on CLTE from use of the trailers do not occur.

Foraging and/or Roosting Impacts. Natural history and interpretive programs occur at Oso Flaco Lake where CLTE forage. The footbridge hand railing at Oso Flaco Lake has also been used in the past by CLTE for perching after chicks have fledged and when adult birds are teaching fledglings to fish in the lake. As a result, foraging and roosting CLTE can be temporarily disturbed by noise and activities associated with interpretive walks and field trips at Oso Flaco Lake. To minimize possible disturbance to foraging and/or roosting CLTE at Oso Flaco Lake, CDPR will continue to either hold programs when CLTE are not present or observe CLTE behavior and modify the program to avoid disturbance. Therefore, effects on CLTE from interpretive programs are considered to be very minimal.

4.4.1.5 Other HCP Covered Activities

4.4.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Nesting Impacts. CLTE are not known to nest near Pismo/Carpenter Creek or the shoreline area near Oso Flaco Creek. In addition, CLTE have not nested near Arroyo Grande Creek since 2005. Therefore, impacts to nesting CLTE in these areas are unlikely.

Foraging and/or Roosting Impacts. Effects on foraging CLTE during motorized vehicle crossings of Pismo/Carpenter Creek, Oso Flaco Creek, or Arroyo Grande Creek are minimal since CLTE forage over water and do not typically forage within the portion of the creek that vehicles will cross. In addition, any vehicle crossing is typically short in duration only lasting a few minutes.

Vehicles crossing creeks drive along the shoreline where CLTE may roost, although most roosting along Arroyo Grande Creek and Pismo Creek occurs at the end of the breeding season after most chicks have fledged. Disturbance of roosting CLTE can occur when these activities are located near occupied CLTE roosting habitat. In addition, vehicles crossing creeks can strike a roosting adult or juvenile, although any roosting bird is able to fly out of harm's way. As with general maintenance activities, impacts to CLTE from CDPR vehicles is minimal due to the implementation of AMMs and the short duration of the creek crossing. Impacts to CLTE from visitors is also somewhat limited due to the short duration of the vehicle crossing the creek and moving to another part of the HCP area. In addition, all vehicles travel at a speed no greater than 15 mph along the riding area shoreline to reduce the risk of a vehicle striking a roosting bird. As a result, vehicle strike is unlikely, although it may still occur if a roosting bird is not seen and does not fly out of harm's way.

4.4.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

Nesting Impacts. CLTE are not known to nest near Pismo Creek. Therefore, impacts to nesting CLTE at Pismo Creek from the installation of Pismo Creek Estuary seasonal bridge are not expected.

Foraging and/or Roosting Impacts. CLTE could use the Pismo Creek bridge handrails, once installed, for roosting, including after chicks have fledged and adults are teaching fledglings to fish; therefore, installation, use, and removal of the bridge could disturb roosting CLTE. To reduce impacts to foraging and/or roosting CLTE, CDPR will continue to implement the SNPL and CLTE management program. Therefore, surveys will be conducted prior to bridge installation and removal to ensure that CLTE are not present in the area. If CLTE are observed, bridge installation or removal will be delayed until the birds have left the area. In addition, CDPR has established an AMM specific to the future bridge location that requires the bridge to be closed to public use until the birds have left the area if visitor activities are observed to be disturbing foraging or roosting CLTE at the bridge location. Therefore, effects from the installation and use of the floating bridge are anticipated to be minimal.

4.4.1.5.3 Limited Trail Riding Area (CA-42)

The limited trail riding area will be located mostly outside the Southern Exclosure, with only a small portion in East Boneyard, and within tertiary CLTE breeding and roosting habitat. No foraging habitat is present. Therefore, impacts to nesting, roosting, and foraging CLTE are not expected. CLTE have been observed flying over the limited trail riding area to reach lake foraging habitat nearby. At times, CLTE have been observed flying as low as 15 feet. At this height, although unlikely, they could be struck by a vehicle traveling through the limited trail riding area. Although the potential for vehicle strike is low, it does exist.

4.4.1.5.4 Replacement of the Safety and Education Center (CA-43)

Nesting Impacts. Almost all CLTE nest inside the Southern Exclosure, which is south of the safety and education center. As a result, the nests within the Southern Exclosure are not anticipated to be impacted by the replacement of the safety and education center.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE have infrequently nested outside the protection of the exclosure. The safety and education center is located north of Post 5 near the Pavilion Hill vegetation island, which is within primary habitat for CLTE (Map 8). Therefore, replacement of this facility could result in destruction or disturbance of a CLTE nest or chicks in the open riding area and not yet discovered by monitors. To reduce the potential to impact a CLTE nest outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure. Any nests found in the open riding area will be quickly protected by a large single-nest exclosure (section 5.3.1). As a result, impacts to CLTE nests or chicks outside the Southern Exclosure from replacement of the safety and education center will be very minimal.

Foraging and/or Roosting Impacts. Effects on foraging and roosting CLTE are not expected during the replacement of the safety and education center since CLTE do not forage on land and they are not known to roost in this area.

4.4.1.5.5 Dust Control Activities (CA-44)

Numerous dust control measures are already in place in the HCP area (section 2.2.5.5) and are expected to continue during the permit term. A limited number of additional dust control measures may occur, including 1) supplemental planting within the 48-acre foredune; 2) an undetermined amount of new non-foredune vegetation planting and seasonal and/or temporary dust control measures; 3) temporary or permanent preservation of some areas of foredune vegetation in the Southern Exclosure; and 4) installing a track-out system at the Pier Avenue entrance to prevent track-out of sand onto paved, public roadways. Dust control activities on the backdunes (tertiary habitat) and Pier Avenue will not impact CLTE. A description of the impacts associated with dust control activities in primary and secondary CLTE habitat follows.

Nesting, Foraging, and/or Roosting Impacts. Most activities associated with dust control (e.g., vegetation planting and maintenance of a temporary monitoring site) will not occur within the Southern Exclosure where CLTE almost exclusively nest. Additionally, additional foredune vegetation is expected to be installed during the rainy season, which concludes prior to CLTE arriving onsite for breeding. Activities will also not be conducted within aquatic habitat. As a result, impacts to nesting, roosting, and foraging CLTE from dust control measure installation are not expected. Supplemental foredune vegetation and preserving vegetation within the Southern Exclosure, however, could affect nesting and roosting CLTE.

The 48-acre foredune, in which CDPR installed experimental planting treatments in February 2020, is located outside the Southern Exclosure area but within CLTE primary habitat. Any associated air quality monitoring equipment could also be in primary habitat but would be outside of the Southern Exclosure.

The 48-acre foredune area has developed moderate amounts of plant cover, low topography, and areas of scattered straw since it was planted in 2020. The foredune area has not been used by CLTE for a night roost, likely because the vegetation establishment has made the area unsuitable. Should CLTE change the location of their night roost to the foredune area, pedestrian and vehicle activities adjacent to the foredune could disrupt night-roosting CLTE. To reduce the risk of disturbance impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Experienced CLTE

biologists will continue to closely monitor the CLTE night roost and will be able to identify most changes in roosting behavior. Over the past 10 years, the night roost has been located within the Southern Exclosure or east of it in fenced bumpout areas. If the location of the night roost changes, CDPR has a protocol in place to protect the CLTE in the night roost from disturbance by recreation activities, including, but not limited to, implementing an appropriate no-disturbance buffer of 330 feet around the night roost, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. Thus, impacts to CLTE in the night roost will be minimized.

The 48-acre foredune area is closed to pedestrians year-round currently, but open to CDPR staff needing to maintain the vegetated areas or to access the air quality equipment. The areas will be opened to pedestrians once CDPR has determined that the vegetation is adequately established. CLTE almost exclusively nest in the Southern Exclosure and have not nested in the foredune areas. Although it is unlikely CLTE will begin nesting outside the Southern Exclosure in the 48-acre foredune area, the cryptic nature of CLTE nests and chicks makes it possible for a nest/chick to be crushed/killed or injured if a nest has not yet been identified by monitors. In addition, vehicle and/or pedestrian activities in the foredune vicinity, and maintenance and pedestrian activities within the foredune itself, could result in disturbance of nesting CLTE, and CLTE could be deterred from incubating eggs or brooding chicks. However, CDPR will implement CLTE AMMs, as appropriate, including closing the 48-acre foredune area to the public if nests are found or by providing a single-nest exclosure as determined by the experienced CLTE biologist if appropriate. CLTE AMMs 1 through 22 reduce the risk of crushing a nest or killing/injuring a chick. These AMMs include conducting daily searches for nests in the foredune areas, protecting any nests found with fencing to ensure a minimum 330-foot avoidance buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. In addition, camping and parking are not allowed within 100 feet of the foredune area and buffer fencing when CLTE nests are present. As a result, this impact will be minimal.

The 48-acre foredune area may increase recreation and motorized activity directly adjacent to the 6 Exclosure as vehicles travel within the gap between the 6 Exclosure and southern edge of the foredune. Recreation and motorized activity adjacent to the 6 Exclosure could result in disturbance to nesting CLTE if they nested near the fenceline of the 6 Exclosure. To minimize impacts to CLTE nests, CDPR will continue to implement the CLTE and SNPL management program, which includes ensuring that a minimum 330-foot no-disturbance buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, is implemented around any CLTE nest and increasing this buffer, as necessary, to ensure nesting CLTE are not disturbed by recreation activities. As a result, this impact will be minimized.

The multi-strand metal fencing used for these foredune areas is similar to fences placed at other vegetation islands. Fences placed in otherwise open habitat can be hazardous to flying birds. Although there are no direct observations of CLTE striking the seasonal exclosure fencing or South Oso Flaco symbolic fence, dead or injured adult/juvenile CLTE have been found within or near the exclosure fence, or nearby shoreline. These birds might have been injured or killed due to striking the fence (CDPR 2014a). Based on previous nesting patterns from 2002 to 2023, CLTE are not expected to nest or form a night roost within the 48-acre foredune areas since they are almost exclusively found nesting and roosting within areas fenced and closed to the public (e.g., Southern Exclosure, CLTE large single-nest exclosures). As a result, CLTE are unlikely to be impacted by the foredune fencing. However, if a CLTE did nest or form a night roost within these areas, it could collide with the multi-strand metal fence when flying from or to the area from another location. In 2015, CDPR began placing thick plastic fencing (orange silt construction fencing cut into approximately 1-foot sections) to the top of sections of the seasonal exclosure to increase the visibility of the exclosure fence and has continued use of the orange fencing from 2016 to 2023 with favorable results (CLTE AMM 75). As a result, if CLTE are observed by a

CDPR biologist to be at risk of fence collision and it is determined necessary to protect CLTE from the risk of fence collision, CDPR will implement this program by lining the top of the 48- acre closure fence in March of each year. It is anticipated the visible fencing will reduce or eliminate the likelihood of a CLTE striking a fence in areas where it is installed.

Temporarily or permanently protecting foredune vegetation within the Southern Exclosure, as opposed to seasonal closure, could reduce the open habitat preferred by nesting CLTE and thereby reduce productivity. This potential for reduced habitat is discussed below. Installing and maintaining closure fencing would not affect breeding CLTE in addition to the effects described in section 4.4.1.2.1 (CA-12a).

Reduced Habitat. Foredune vegetation associated with dust control activities is being established in CLTE primary habitat, and some areas of foredune vegetation in the Southern Exclosure may be temporarily or permanently preserved. Approximately 44 acres of primary habitat have been planted with foredune vegetation, and the remaining 4 acres were not planted as a control but may be planted in the future. Additional vegetation may also be planted within and/or adjacent to CLTE secondary habitat. The current vegetation has resulted in making the 48-acre foredune area less suitable for CLTE nesting, and CLTE continue to nest almost exclusively within the Southern Exclosure and have avoided nesting in habitat north of Post 6 due to the heavy recreation use occurring in this area. Reducing CLTE habitat by planting vegetation in suitable primary and secondary habitat or allowing denser vegetation to develop in the Southern Exclosure could lead to less open (or wide), sparsely vegetated habitat and steeper hummocks, reducing nesting initiation and success and potentially increasing predation on adults, chicks, and/or eggs. Depending on the density of the foredune vegetation and topography, the area may still retain some suitable CLTE nesting habitat characteristics. CDPR will also implement all AMMs (Table 5-3), as appropriate, to reduce impacts associated with dust control, including managing habitat in the Southern Exclosure to ensure it retains the necessary physical and biological characteristics of primary habitat as defined section 3.3.2.8 and indicated by breeding productivity. With these measures, impacts are expected to be reduced.

Increased Predators. Vegetation planted for dust control, especially vegetation planted within primary or secondary habitat, and denser vegetation and steep hummocks allowed to develop within the Southern Exclosure, may impact breeding CLTE by providing habitat for mammalian predators to hide and stalk nesting and/or roosting CLTE or may attract avian predators to hunt vegetated areas closer to CLTE breeding areas. In addition, the wire fence surrounding the vegetation areas is the same type as vegetation island fence and does not keep coyotes or other predators out of the area. At this time, the extent of these indirect impacts from dust control activities is not known. CDPR will implement all CLTE AMMs (Table 5-3), as appropriate, to reduce impacts from dust control activities. These measures will include continuing CDPR's predator management program, which has been successful at controlling predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. The predator management program has likely increased reproductive success for CLTE and is expected to alleviate any impacts associated with additional vegetation being planted near CLTE habitat. CDPR reviews the predator management plan as needed in coordination with USFWS and may update the plan to identify additional appropriate measures in response to new predators or concerns. As a result, these effects are anticipated to be minimal.

4.4.1.5.6 Cultural Resources Management (CA-45)

Cultural resource management activities are generally conducted outside areas where CLTE are typically observed or outside the CLTE breeding season and do not affect CLTE. In the unlikely event that cultural resource management activities must occur in CLTE areas where CLTE typically nest, forage, and/or roost in the future during the breeding season, these activities could disturb and/or displace CLTE from roosting or nesting. To reduce any impacts from cultural resource management activities, CDPR will

continue to implement the SNPL and CLTE management program. Therefore, surveys will continue to be conducted in areas where CLTE could occur to ensure CLTE nests, adults, and chicks are not present within and near the cultural resource management area, and activities will be delayed until an experienced monitor determines that no impacts will occur if a CLTE is observed during the surveys. Furthermore, environmental monitors will continue accompanying archaeologists in the field when cultural resources protection work will be occurring within or adjacent to the Southern Exclosure where CLTE are known to nest and roost to limit the potential for disturbance to nesting or roosting CLTE. Therefore, the effects from cultural resources management are considered to be very minimal and will continue to be minimal in the future.

4.4.1.5.7 CDPR Management of Agricultural Lands (CA-46)

Management on agricultural lands does not affect CLTE since agricultural lands are not CLTE breeding or foraging habitat.

4.4.1.5.8 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

Maintenance of a bioreactor on agricultural lands does not affect CLTE since the agricultural lands are not CLTE breeding or foraging habitat.

4.4.1.5.9 Oso Flaco Lake Boardwalk Replacement (CA-48)

Nesting Impacts. Oso Flaco Lake is not CLTE nesting habitat; therefore, CLTE nests will not be affected.

Foraging and/or Roosting Impacts. CLTE could use the Oso Flaco Lake boardwalk handrails for roosting, including after chicks have fledged and adults are teaching fledglings to fish. Oso Flaco Lake has also been used by CLTE to forage for fish in past years but has been rarely used in recent years. Therefore, Oso Flaco Lake boardwalk replacement could disturb foraging and/or roosting CLTE if work is conducted when CLTE are likely to be present in the HCP area (generally April 15 to September 15). To reduce impacts to foraging and/or roosting CLTE at Oso Flaco Lake, trained CLTE monitors will conduct surveys prior to any boardwalk construction to assess whether CLTE are present in the area, and if so, whether CLTE may be disturbed. If so, the monitor will delay construction activities within 250 feet of the CLTE until it leaves of its own accord. Additionally, the Oso Flaco Lake boardwalk is a long structure that will be replaced in sections, leaving many sections of the boardwalk and surrounding lake undisturbed at any given time. Given the surveys for CLTE, establishment of a buffer if needed, and the remaining undisturbed aquatic habitat, effects of replacing the boardwalk on CLTE are expected to be minimal. CDPR will also develop additional AMMs prior to the activity, if deemed necessary, as part of the adaptive management process (section 5.5).

4.4.1.5.10 Special Projects (CA-49)

Nesting Impacts. Special projects include activities required to meet a facility's need, such as installing vault toilets (section 2.2.5.10). Though the actual location of the special projects is not yet known, this HCP anticipates that special projects could directly affect up to 35 acres of 4,154 acres of available CLTE habitat over the permit term, although less than 950 acres are within primary and/or secondary habitat (i.e., 698 acres in primary habitat and 250 acres in secondary habitat) where CLTE may potentially nest. Special projects within tertiary habitat are not expected to affect CLTE since CLTE rarely, if ever, occur within tertiary habitat. Specials projects in primary and secondary habitat will be conducted outside of the CLTE breeding season to the extent feasible. If special projects in primary and secondary habitat are conducted during the breeding season, they will not be conducted within the Southern Exclosure; therefore, nesting CLTE are not expected to be affected by special projects since CLTE almost exclusively nest within the Southern Exclosure.

Should a CLTE pair nest outside the Southern Exclosure, construction activities and vehicles associated with special project construction could crush eggs, chicks, or adults or disturb CLTE chicks or adults in an active CLTE nest that is in the open riding area and not yet identified by monitors. To reduce impacts to SNPL nests that could occur outside the Southern Exclosure, CDPR will continue to implement the SNPL and CLTE management program. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the Southern Exclosure, and any nests found in the open riding area will be quickly protected with symbolic or wire fencing and a large single-nest exclosure will be installed as soon as possible, thus reducing the likelihood of construction activities destructing or disturbing a nest. Furthermore, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until CLTE are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project that could impact CLTE. As a result, this effect is expected to be minimal.

Foraging and/or Roosting Impacts. Foraging CLTE are not expected to be affected by special projects, since special projects will not occur within aquatic habitat.[64] Roosting CLTE may be disturbed during special project activities because roosting activities could be interrupted. However, 3,130 acres of the 4,154 acres where special projects could occur are located in tertiary habitat, where CLTE are not expected to roost. Special project activities are expected to be infrequent and short duration in CLTE primary and secondary habitat and will not occur in areas where CLTE typically roost (i.e., the Southern Exclosure, fenced bumpout areas). In addition, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until CLTE are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project in areas that could impact CLTE. As a result, this effect is expected to be minimal.

Reduced Habitat. The placement of special projects within CLTE primary and secondary breeding habitat reduces the amount of habitat available to CLTE for breeding by precluding them from nesting within the footprint of the structures. However, special projects will rarely be placed within primary and/or secondary habitat. In addition, special projects are small (i.e., not to exceed 35 acres over the permit term), and they are placed in areas where CLTE do not typically nest (i.e., outside the Southern Exclosure). In addition, special project plans within areas that could impact CLTE will be submitted to the USFWS for review and approval prior to construction. Therefore, this effect is anticipated to be minimal.

4.4.1.5.11 Reduction of the Boneyard and 6 Exclosures (CA-50)

Reduction of the Boneyard and 6 Exclosures is not expected to result in additional impacts to adult and/or juvenile CLTE beyond those described above for motorized recreation (section 4.4.1.1.1) and pedestrian activities (section 4.4.1.1.3) since CLTE almost exclusively nest within the protection of exclosure fences. In addition, CLTE AMMs would be implemented, as appropriate, including installing single-nest exclosures or bumpouts around any CLTE nest within the open riding area, and any CLTE adults and/or juveniles found outside an exclosure would typically be expected to fly out of harm's way.

Elimination of East Boneyard (approximately 47 acres) and incremental elimination of 6 Exclosure (62 acres) could result in the permanent loss of up to 109 acres of protected breeding habitat. This reduction represents approximately one-third of the 368 acres of CLTE breeding habitat currently protected by the Southern Exclosure (300 acres in the Southern Exclosure and 68 acres in Oso Flaco Exclosure).

[64] Effects of boardwalk replacement at Oso Flaco Lake are described in section 4.4.1.5.9.

It is expected that the removal of the East Boneyard Exclosure from the Southern Exclosure could be accomplished with no direct impact on nesting CLTE at East Boneyard because CLTE have not nested there since 2007. CLTE are also not known to form their night roost in the East Boneyard Exclosure; therefore, it is expected the East Boneyard Exclosure can be removed with no direct impact on roosting CLTE.

The East Boneyard Exclosure can provide a buffer between recreational disturbance in the open riding area and CLTE nesting habitat in West Boneyard. Removal of the East Boneyard Exclosure may thus result in motorized recreation activities adjacent to the West Boneyard Exclosure where CLTE could nest, but CLTE have not nested within the West Boneyard Exclosure since 2009. If any CLTE within the West Boneyard Exclosure are observed to be disturbed by increased recreation and/or new travel patterns within the former East Boneyard Exclosure, a bumpout will be installed as described in the CLTE AMMs to ensure that disturbance in this area is minimized. As a result, this impact would be minimal.

The 6 Exclosure has had greater nesting success and is one of the higher producing exclosure areas. From 2005 to 2023, between 4 and 39 CLTE nests (i.e., 7 to 87 percent of the total CLTE nests) have been established in the 6 Exclosure annually. Therefore, removal of some of the 6 Exclosure could expose nesting and/or roosting CLTE to recreation and other activities. Individuals not protected by the exclosure fence could be killed, injured, or disturbed if activities occur close by. However, from 2005 to 2023, fourteen CLTE nests have occurred within the northern 328 feet[65] of the 6 Exclosure, eight of those nests in 2022, five in 2021, and one in 2010. As a result, the 6 Exclosure reduction could expose eight nests during the first incremental decrease of the exclosure, although this is unlikely since CLTE are expected to avoid areas that are regularly disturbed and continue to move south in the remaining protected Southern Exclosure area. If the entire 6 Exclosure is removed, between 4 and 39 nests could be exposed to recreation, assuming they do not relocate. In addition, if the CLTE population increases, then more CLTE breeding activity might occur in the open riding area.

During the breeding season, adult CLTE not engaged in incubation or chick care often assemble in a communal night roost and are joined by fledglings later in the breeding season. From 2007 to 2023, the high count of CLTE in the night roost has ranged from 35 to 95. The CLTE night roost had been located in the northern 6 Exclosure from 2004 to 2019 but was also located in other areas of 6 and 7 Exclosures from 2015 to 2018. Since 2020 the location has been increasingly variable, with roosts detected in 6 Exclosure, 7 Exclosure, and east of these exclosures within fenced bumpout areas. The reduction of the 6 Exclosure will reduce the habitat available for the CLTE night roost. Although unlikely,[66] if CLTE do form the night roost in the former 6 Exclosure area that is open to vehicles and recreation, between 35 and 95 individuals could be susceptible to vehicle strike and/or disturbance from recreation. Disturbance could deter CLTE from resting and could result in increased vigilance and stress.

From 2005 to 2023, the average density of CLTE nests within the 6 Exclosure has ranged from 0.07 to 0.65 nests/acre. This does not include concurrently active SNPL nests, interspersed with CLTE nests. CLTE chicks and adults have been observed leaving the exclosure and entering the open riding area in some years. Reduction of the 6 Exclosure could exacerbate this this issue by reducing the amount of habitat available for nesting and rearing chicks so that nests must be established in closer proximity and

[65] CDPR may reduce the exclosure via other configurations, such as east-to-west. Both scenarios are expected to result in similar impacts since CLTE almost exclusively nest within the Southern Exclosure and do not use the shoreline to forage. For consistency with the SNPL analysis, this section focuses on a north-to-south, 328-foot or approximately 7.5-acre reduction.
[66] CLTE are expected to move south and form a night roost in the protected area that is free of disturbance. In addition, the night roost is regularly monitored, so impacts related to a change in night roost location are expected to be observed quickly.

adults are pushed into the open riding area more frequently. If the 6 Exclosure is reduced incrementally by 328 feet in a breeding season, CLTE that would otherwise establish nests in the former closure area may instead move south into the remaining protected area, which would increase the density of nests in the 6 Exclosure. Ideally, adequate habitat would be available for CLTE to continue to nest without adverse interactions; however, in a worst-case scenario, nest density could increase to a point where CLTE nests and chicks could be pushed into the open riding area.

To ensure that CLTE continue to nest and roost within the HCP area at levels that contribute to the overall population of CLTE, the 6 Exclosure will not be reduced unless specific criteria are met (section 5.2.3) and maintained, including obtaining a CLTE breeding population with a 5-year average of 35 nesting pairs and a fledge rate of 1.0 fledglings per pair over the same period. In addition, the exclosure will be reduced in increments (e.g., 328-foot sections per year), allowing for close monitoring of and response to any nests initiated outside the exclosure. Any such nests would be protected by a large single-nest exclosure, thus reducing the likelihood of impacting nesting CLTE. The existing Southern Exclosure will be enlarged, if necessary, to encompass nests adjacent to the existing fence boundary (e.g., within or close to the minimum 330-foot buffer distance). A large exclosure with be provided to surround two or more nests within 500 feet of each other in the open riding area (if topography allows and is safe public traffic patterns are available). In addition, bumpouts would be installed as necessary to reduce disturbance to CLTE nesting near the areas open to motorized recreation. Fencing for all such exclosures will continue to be maintained a minimum distance of 330 feet from the nest site, or other distance based on best available site-specific information, and in consultation with Wildlife Agencies.

Prior to hatch, silt fencing or small mesh chick fencing will be installed within the exclosure or attached to lower portion of the exclosure fence to prevent CLTE chicks from traveling into the open riding area. Furthermore, monitors will track changes in the night roosting behavior of CLTE and ensure the night roosts are protected within an exclosure. If a night roost is found in the open riding area, CDPR will close off the night roost area with fencing as soon as possible and implement a 330-foot no-disturbance buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, around the night roost. With these measures in place, the effects of reducing the Boneyard and 6 Exclosures on CLTE are expected to be reduced by minimizing mortality and disturbance-related impacts and ensuring that a viable population of CLTE continues to breed within the HCP area.

4.4.1.5.12 Use of Pesticides (CA-51)

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, potential for indirect effects exists in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species. Moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general. Any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Indirect exposure to birds, fish, or amphibians can occur when they eat contaminated prey or vegetation. Direct exposure can occur when birds, fish, or amphibians contact pesticide residues with their skin or eyes or when they inhale vapors or particulates. Expected effects from each pesticide are described in more detail below.

Nesting Impacts. Insecticides are not applied during the CLTE breeding season. Therefore, insecticides will not affect CLTE.

Herbicides are used during the CLTE breeding season; however, they are not used in areas known to be occupied by CLTE. CLTE could be impacted by drift from herbicides sprayed outside, but nearby known breeding areas. In addition, CLTE outside known breeding areas that have not yet been discovered by monitors can be impacted by herbicides as described below for foraging and/or roosting impacts. AMMs listed in Table 5-3 reduce or eliminate these impacts.

Aerial spraying of herbicides has the potential to flush CLTE. However, aerial spraying is conducted in the backdunes, which is outside areas where CLTE nest or roost. In addition, aerial spraying includes a 200-foot buffer from aquatic resources where CLTE forage. As a result, CLTE are not impacted by aerial spraying activities.

Foraging and/or Roosting Impacts. A general description of the location where each herbicide is used in the HCP area in relation to CLTE habitat and the anticipated effects of each herbicide on CLTE follows.

Glyphosate is sometimes used in suitable CLTE habitat (i.e., foredunes and near Oso Flaco Lake) to control European beach grass and Russian wheat grass. Numerous scientific and regulatory reviews have examined the potential direct effects of glyphosate on a wide variety of wildlife species, including birds. Such reviews consistently conclude that the use of glyphosate products in accordance with product labels does not pose a significant risk of either direct acute or chronic toxicity to terrestrial wildlife species (EPA 1993, Giesy, Dobson and Solomon 2000, Tatum 2004, SERA 2011a, Pest Management Regulatory Agency 2015). The detailed risk assessment conducted by SERA (2011a) calculated the risk to small mammals and birds based on the relationship between estimated exposure (e.g., via direct overspray or through consumption of contaminated vegetation, water, insects, or fish) following application of glyphosate-based herbicides at a rate equivalent to 2.24 kg acid equivalent/ha, as compared to no observable effect levels in laboratory animals, considering both acute and chronic (longer term exposures). In summary, the author stated that, congruent with the EPA (1993) assessment, “none of the hazard quotients for acute or chronic scenarios reach a level of concern even at the upper ranges of exposure.” EPA completed a biological evaluation for glyphosate and determined glyphosate is likely to adversely affect least tern, but not specifically CLTE (EPA 2021a). Future consultation between EPA and USFWS may result in additional mitigation measures for glyphosate use (EPA 2021b), which may or may not be applicable to the HCP area.

Fluazifop-p-butyl is typically used in the backdunes to control perennial veldt grass. Veldt grass grows in upland habitat; therefore, fluazifop-p-butyl is not typically used in or near CLTE foraging or roosting habitat. In addition, Fluazifop-p-butyl is found to be practically non-toxic (Class 0) to avian species (White 2007).

Imazapyr is sometimes used in suitable CLTE habitat (i.e., foredunes) to control European beach grass and Russian wheat grass. The available avian studies on imazapyr, all of which were conducted up to limit doses, do not report any signs of toxicity (SERA 2011b).

Triclopyr is typically used to control Cape ivy, which occurs in riparian habitat and may occur near CLTE foraging habitat. Triclopyr acid is found to be practically non-toxic (Class 0) to slightly toxic (Class 1) to birds (EPA 1998).

Aminocyclopyrachlor is typically used to control iceplant, which sometimes occurs in suitable CLTE habitat (i.e., foredunes). The EPA/Office of Pesticide Programs (2010) classifies aminocyclopyrachlor as practically non-toxic (Class 0) or only slightly toxic (Class 1) to mammals, birds, fish, and aquatic invertebrates (SERA 2012).

Chlorsulfuron is typically used to control iceplant, which sometimes occurs in suitable CLTE habitat (i.e., foredunes). CDPR’s current application rates and use patterns for chlorsulfuron pose a negligible risk to wildlife. The EPA pesticide registration process requires toxicological data be supplied to evaluate avian

tolerance to chlorsulfuron. Data from the available literature indicate that chlorsulfuron has low toxicity to birds. Acute dietary exposure did not result in toxic effects at 5,000 ppm (equivalent to 500 mg/kg BW-day in mallards) and at 5,620 ppm (equivalent to 3,394 mg/kg BW-day in bobwhite quail) using technical grade chlorsulfuron (ENSR International 2005).

Aminopyralid is typically used to control Cape ivy, which occurs in riparian habitat and may occur near CLTE foraging habitat. In Dow AgroSciences laboratory testing, aminopyralid has been shown to be "practically non-toxic" (Class 0) to birds, fish, honeybees, earthworms, and aquatic invertebrates (EPA 2005, DOW Chemical Company AgroSciences 2008).

Sethoxydim is slightly toxic to birds (SERA 2001); however, it is used in the backdunes to control perennial veldt grass, which is outside areas where CLTE typically nest, forage, and/or roost.

Clethodim is used in the backdunes to control perennial veldt grass, which is outside areas where CLTE typically nest, forage, and/or roost. In addition, clethodim is practically non-toxic to birds and is unlikely to pose a hazard to avian species (SERA 2014).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA ®. Competitor® is a surfactant labeled for aquatic use, with either imazapyr or glyphosate. Little information is available regarding the potential effects of Competitor® on CLTE; however, the product safety data sheet states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a). Renegade EA ® is a surfactant labeled for aquatic use that is made of methylated seed oil, UAN solution, and nonionic surfactant. Little information is available regarding the potential effects of Renegade EA® on CLTE; however, the product safety data sheet also states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016b).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area results in overall benefits to CLTE by preventing invasive plants from taking over CLTE habitat or providing hiding places for predators. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to SNPL decrease with increasing distance away from the treated field or site of application. CDPR takes extra precautions applying pesticides near sensitive habitats that support CLTE. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Chapter 5 largely educe or eliminate these impacts.

4.4.1.5.13 CDPR UAS Use for Park Activities (CA-52)

Nesting and Brooding Disturbance. CDPR will avoid flying UAS in areas where breeding CLTE will be affected, if possible. However, CDPR may use UAS in or near CLTE nesting or brood rearing habitat during the breeding season for some activities (e.g., predator management, habitat enhancement, CLTE monitoring, or public safety/law enforcement purposes). As discussed in section previously, in 2018, prior to the SNPL/CLTE breeding season, CDPR staff evaluated using a UAS to assess the amount of wrack present on the shoreline within SNPL breeding habitat. The UAS was found to be highly effective. During the UAS flight, CDPR observed a nearby small flock of SNPL and other shorebirds, which did not flush or crouch in response to the UAS, although CLTE may respond differently than do shorebirds. CDPR has continued occasional UAS flights during the 2019-2023 non-breeding seasons, and monitors observed SNPL to be unharmed. Reactions to UAS can vary greatly among bird species and even among species within the same family, such as gulls and terns (Barr, et al. 2020). At least one species of tern has been shown to readily habituate to UAS (Chabot, Cralk and Bird 2015), suggesting potential exists to use

UAS among colonial nesting species such as CLTE without significant disturbance. In addition, AMMs (Table 5-3) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, initiating flights at least 330 feet from the closest known nest location, following existing monitoring guidelines that have been established by USFWS, having a trained biologist scan the area for roosting and nesting CLTE before every flight, having a trained biologist monitor during the flight if CLTE are observed, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, and flying UAS at least 100 feet above ground at all times and moving UAS to higher altitude or aborting the mission if UAS are observed disturbing nests or broods. Certain public safety UAS uses, such as search and rescue, may prevent implementing all such measures, but such incidents are not common, and all UAS operators will receive training to minimize effects on CLTE as much as possible even during emergencies. As a result, UAS are expected to have minimal impacts on nesting, foraging, and/or roosting CLTE during the breeding season, although some disturbance may occur depending on the protocol necessary for the specific data gathering. Overall, UAS will likely collect valuable information on CLTE habitat, predators, and breeding that will inform future management decisions within the HCP area.

Foraging and/or Roosting Disturbance – Breeding Season. UAS use outside the breeding season would not affect CLTE. UAS may be used during the breeding season outside occupied CLTE breeding habitat and could disturb roosting and/or foraging CLTE. However, Vas et al. (2015) assessed reactions by a variety of waterbirds to approaches by UAS and found that the birds remained unaffected in most cases, suggesting the potential to use UAS without significant disturbance. In addition, AMMs (Table 5-3) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, scanning the area for roosting or foraging CLTE prior to every flight, flying UAS at least 100 feet above ground, and ensuring all flights are approved by the Environmental Resources Project Manager. As a result, UAS are expected to have minimal impacts on foraging and/or roosting CLTE.

4.4.2 Anticipated Take of California Least Tern

This section quantifies the potential for incidental take of CLTE due to the effects described in the preceding section. Given that both covered activities and the conservation program described in this HCP are largely ongoing, incidental take estimates are based primarily on past take data. The take numbers presented in this HCP account for worst-case past observations of mortality and injury that have been observed only rarely during the timeframe from 2002 to 2023 and do not happen most years. Oceano Dunes District will continue to manage for breeding CLTE targets. The estimates recognize that not every egg or individual CLTE may be detected. These data have resulted from long-term, intensive monitoring within the HCP area. It is estimated that a similar level of future take will occur if CDPR maintains a similar set of conditions for the CLTE population within the HCP area in the future.

The following sections estimate incidental take of CLTE based on the effects analyses (section 4.4.1). The effects analyses provide a complete discussion of all aspects of covered activities that could possibly impact the covered species. However, not every effect on a covered species rises to the level of take.

The CLTE is a California fully protected species. As such, CDFW may only permit take of CLTE (as defined by CESA[67]) necessary for scientific research or pursuant to an approved NCCP.[68] CDPR is seeking take authorization from CDFW separately.

This HCP quantifies lethal take, capture, and harm of CLTE within the HCP area in terms of:

- Take of individual CLTE adults, juveniles, chicks, and eggs caused by park operations, recreation, and other activities not related to covered species management.
- Take of CLTE caused by covered species management-related activities that are specifically implemented to protect nests and individuals from public activity (i.e., fencing, single nest exclosures). Impacts from management activities related to monitoring and protecting CLTE (recovery activities) are referenced in Appendix C and will be authorized under the 10(a)(1)(A), Recovery Permit (TE-815214-10).

CDPR dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season. This program has been modified over the years based on CDFW and USFWS guidance to avoid impacts to CLTE from park operations and recreation activities. As a result, the effects of many of the covered activities on CLTE are not anticipated to rise to the level of take, as defined by FESA. In fact, mortality and/or injury of CLTE in the HCP area due to park operation, recreation, and other activities not related to Recovery Permit activities has been infrequent.[69] Lethal take and harm to nesting CLTE due to park operation, recreation, and natural resources management-related activities not related to Recovery Permit actions is largely due to the implementation of AMMs. However, some lethal take or harm of CLTE could still occur despite the infrequency of take to date and the implementation of AMMs. The estimated incidental take of CLTE is summarized in Table 4-5 and discussed in detail below.

4.4.2.1 Take of CLTE Adults, Juveniles, Chicks, and Eggs from Park Operations, Recreation, and Other Activities Not Related to Recovery Activities

This section provides an estimate of CLTE take that could occur during covered activities not specific to recovery activities under the USFWS 10 (a)(1)(A) permit TE-815214-10 (referred to as “non-recovery” activities/actions). Take estimates are generally based on worst-case past observations of CLTE in the HCP area. All take estimates also account for the conservation program measures and AMMs since the conservation program is an ongoing practice in the HCP area. Table 4-5 summarizes the estimates for take of CLTE adults, juveniles, chicks, and eggs.

4.4.2.1.1 Take of Adults and Juveniles

CDPR dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season. As a result, take that could otherwise occur during the breeding season is minimized.

[67] Take, as defined under CESA, is any action or attempt to “hunt, pursue, catch, capture, or kill.”
[68] Section 2835 of the Fish and Game Code allows CDFW to authorize by permit the taking of any covered species, including those designated as fully protected species, whose conservation and management is provided for in a NCCP approved by CDFW. Take authorization is also allowed for certain specified infrastructure and other projects not applicable to the covered activities (Fish & Game Code § 2081.15).
[69] Monitoring of CLTE was not conducted regularly in the HCP area until 2001. Therefore, data prior to 2001 only include mortalities or injuries that were incidentally observed in the HCP area.

Take of adult and juvenile CLTE is most likely to occur from motorized vehicle recreation (section 4.4.1.1.1), covered species management (section 4.4.1.2.1), and park operations (sections 4.4.1.3 through 4.4.1.5), although some take may occur due to non-motorized vehicle recreation (4.4.1.1.2 through 4.4.1.1.9). Most CLTE nest within the Southern Exclosure and are thus protected from vehicles and other motorized and non-motorized activities. However, some CLTE could occasionally nest outside the Southern Exclosure in areas open to vehicles and other activities. Park staff monitor the habitat outside the exclosure daily, looking for CLTE and signs that they may be nesting outside the exclosure. Nests found in the open riding area are protected within large single-nest exclosures. Although the majority of the nests outside the Southern Exclosure are likely found, due to the cryptic nature of the nests, some nests could go undetected and adults sitting on the nest or protecting the nest could be killed or injured from collisions with motorized vehicles.

Additional take of adults and/or juveniles could occur if park visitors pick up (i.e., "capture") an injured bird. Although this event is rare, a park visitor picked up an injured juvenile CLTE in the HCP area and gave it to park staff in 2010, who then returned it to the exclosure.

Fledglings are also sometimes observed in the open riding area. These fledglings are typically monitored until they return to the protected exclosure. However, because they are new to flying, they may not move as quickly from an approaching vehicle and thus could be at risk of lethal take during the time they are in the open riding area. In addition, some portion of the juveniles that enter the open riding area may go undetected and could be injured or killed.

Estimates of adult and juvenile CLTE lethal take and/or harm are largely based on the following past observations of injured and dead CLTE. The annual mean minimum number of breeding adults at Oceano Dunes SVRA from 2002 to 2023 was 40 breeding pairs (Table 3-11). From 2001 to 2023, 22[70] dead or injured adult and/or juvenile CLTE that could have been killed or injured by trauma were recovered in the areas open to non-motorized and/or motorized recreation (Table 4-4). As a result, these deaths could be attributed to motorized and non-motorized activities, including recreation activities and/or park operations. The highest documented mortality of juvenile and/or adult CLTE was in 2014, when five juveniles and/or adults were found dead.

Table 4-4. Summary of Annual Injury or Mortality of Adult and Juvenile CLTE, 2001-2023

Year	Adult mortality	Juvenile mortality	Adult injury	Juvenile injury	Total
2001	1	0	0	0	1
2002	0	0	0	0	0
2003	0	2	0	0	2
2004	0	0	0	0	0
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	0	0	0	0	0

[70] A juvenile was found with a wing injury in the open riding area in 2014 and is included in this number; however, the cause of the wing injury is unknown. Other CLTE individuals with wing injuries have been observed in the HCP area in the past. Although the events causing wing injuries were not observed, they were attributed to potential collision with exclosure fencing.

Table 4-4. Summary of Annual Injury or Mortality of Adult and Juvenile CLTE, 2001-2023

Year	Adult mortality	Juvenile mortality	Adult injury	Juvenile injury	Total
2009	0	0	0	1	1
2010	0	0	0	1	1
2011	0	0	0	1	1
2012	0	0	0	0	0
2013	0	1	1	0	2
2014	1	4	0	2	7
2015	0	1	0	1	2
2016	0	0	0	1	1
2017	2	0	0	0	2
2018	0	0	0	0	0
2019	0	1	0	0	1
2020	0	0	0	0	0
2021	1	0	0	0	1
2022	0	0	0	0	0
2023	0	0	0	0	0
Total	**5**	**9**	**1**	**7**	**22**

Some CLTE adults or juveniles may be killed or injured if they collide with the exclosure fence when they are flushed from the exclosure. In 2014, two recorded incidents of CLTE injury (both juveniles) and five dead CLTE (four juveniles and one adult) were documented within the 6 Exclosure or nearby shoreline (Table 4-4). It is not known how these injuries or mortalities occurred; however, it was suspected that the injuries could have been a result of colliding with the exclosure fence. Since 2015, AMMs (e.g., marking the top of the seasonal exclosure fence with visible orange silt fencing) have been implemented in the HCP area to attempt to prevent mortality or injury from a CLTE striking a fence. Although incidents of CLTE striking a fence will likely be reduced, this HCP accounts for the possibility that it could still occur. Additional injuries that may have been the result of CLTE colliding with the exclosure fence or other causes occurred in 2001 (one dead adult from motorized recreation), 2003 (two dead juveniles), 2009 (one injured juvenile), 2010 (one injured juvenile), 2011 (one injured juvenile), 2013 (one injured adult and one dead juvenile), 2015 (one injured juvenile and one dead juvenile), 2016 (one injured juvenile), 2017 (two dead adults), 2019 (one dead juvenile), and 2021 (one dead adult).

In addition, as stated previously, fledglings are sometimes observed in the open riding area. These fledglings are typically monitored until they return to the exclosure and no harm occurs. However, because they are new to flying, they may not move as quickly from an approaching vehicle and thus could be at risk of lethal take during the time they are in the open riding area. Although these instances are not always documented, up to 12 juveniles in a year have been observed in the open riding area and directed back to the safety of an exclosure. AMMs are effective at protecting juveniles in the open riding area, however, some portion of these individuals may go undetected. For the purpose of this HCP, it is assumed that five juveniles could enter the open riding area and be injured or killed prior to CDPR implementing AMMs. Additional injured or dead CLTE adults and/or juveniles are found in the HCP area in some years, and the cause for the injury and/or mortality cannot be determined. Some of these injuries and/or mortalities could be the result of non-recovery activities, including park operations and

recreation. Finally, fence strikes could result in up to seven adults or juveniles being killed or injured from fence strikes. Therefore, based on these past levels of take, this HCP anticipates that a maximum of 12 juveniles and/or adults could be injured or killed in the HCP area in a year. In addition, because 12 juveniles and/or adults being injured or killed per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 year within a 5-year period will result in the maximum take levels and other years will have lower take levels. As a result, this HCP estimates that no more than 15 juveniles and/or adults will be injured or killed in the HCP area over a 5-year period. Due to size and cryptic coloration, it is assumed the detection rate of dead or injured birds is low, and some birds that are injured or killed are not observed. Therefore, this take estimate considers a worst-case scenario where additional dead birds may not be discovered.[71]

4.4.2.1.2 Take of Chicks and Eggs

Take of eggs and chicks during recreation, park operations, and other activities that are not related to recovery activities may occur by collision with motorized vehicles and by non-motorized activities. Specifically, take may occur if eggs or chicks are abandoned because an adult is killed or injured, such as in a collision with a motorized vehicle or with a fence. Additional take of eggs or chicks could occur if pedestrians step on eggs or chicks that are not protected within the Southern Exclosure or within a single-nest exclosure. However, such incidents have not been documented in the HCP area; therefore, this risk of take is anticipated to be low. Park visitors may also pick up chicks (i.e., “capture chicks”). To date, a park visitor has not been documented picking up a CLTE chick; however, it has been documented for SNPL and could occur for CLTE.

Recreation, park operations, and other activities not related to recovery activities could also disturb attending adults or broods to the extent that adults abandon a nest or chicks are separated from the attending adult and either abandoned or malnourished. This is especially true if adults and chicks leave the safety of the Southern Exclosure and enter an area open to vehicles where they could be separated from adults or struck by a vehicle and are at risk of lethal take. In the HCP area, chicks in the Southern Exclosure are carefully monitored, and most instances when they enter the open riding area are documented. Therefore, it is possible to estimate when chicks are at risk of lethal take based on past observations of these occurrences. However, the likelihood of chicks entering an area open to vehicles has been reduced due to implementation of a minimum 330-foot buffer around CLTE nests, and mortality or injury of a chick that does enter an area open to vehicles is likely a rare event due to the implementation of AMMs, such as stopping traffic in the area and directing chicks back to the safety of the exclosure.

Two CLTE chicks found dead in the HCP area in 1998 and 1999 were considered likely to have been run over by an OHV. These two chick mortalities are the only such occurrences recorded prior to 2001,[72] and other instances have not been documented in the HCP area since that time. Due to the cryptic nature of the chicks, however, it is possible that some small number of mortalities has gone undetected. Chicks can also be injured by exclosure fencing, although this has only been documented in the HCP area once in 2010, when a chick’s wing was caught on a fence wire and the wing appeared to be injured. In

[71] Although the majority of dead or injured adults/juveniles are likely found, not all dead or injured adults/juveniles are assumed to be detected due to CLTE that are scavenged or buried prior to discovery and CLTE cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured adults/juveniles may not have been discovered in some years.

[72] Monitoring of CLTE was not conducted regularly in the HCP area until 2001. Therefore, data prior to 2001 only includes mortalities that were incidentally observed in the HCP area.

addition, based on data collected in the HCP area in the past, chicks have been observed in the open riding area where they are at risk of vehicle strike or being separated from an attending adult. The greatest number of chicks documented leaving the protection of the exclosures and entering the open riding area where they were at risk of lethal take was six chicks in 2010, although chicks are known to have entered the open riding area in other years as well. Although chicks observed in the open riding area are monitored and successfully directed back to the exclosure, they are at risk of being injured or killed for the period of time that they are in the open riding area. In addition, despite intensive monitoring, some chicks may enter the open riding undetected. For the purpose of this HCP, it is assumed that four chicks could enter the open riding area and be injured or killed prior to CDPR implementing AMMs. Additionally, although difficult to document, it is possible that abandonment due to an adult mortality could have occurred that was not observed or attributed to recreation, park operations, or other non-recovery activities. In this HCP, it is assumed this could occur for up to two chicks a year. This HCP thus anticipates that a maximum of eight chicks[73] could be injured or killed in a year. In addition, because eight chicks being injured or killed in a year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes that only 1 or 2 years within a 5-year period will have the maximum take levels, and other years will have lower take levels. As a result, this HCP estimates that no more than 15 chicks will be injured or killed in the HCP area over a 5-year period due to recreation, park operations, and other non-recovery activities. Due to size and cryptic coloration, it is assumed the detection rate of dead or injured birds is low. Therefore, this take estimate considers a worst-case scenario where a relatively high amount of incidental take may occur, or some number of dead birds may not be discovered.

The potential for incidental take of eggs (i.e., the potential for eggs to be crushed or abandoned) due to recreation, park operations, and other non-recovery activities was estimated from the number of nests that were thought to have been abandoned due to an adult being disturbed by recreation activities before a bumpout was installed to reduce disturbance. Between 2001 and 2023, six nests (with up to two eggs each) were thought to have been abandoned due to recreation activities based on direct observation of an adult being disturbed by vehicular or other activity prior to abandonment and/or the proximity of the nest to the open riding area. These nests include one in 2009 (two eggs), three in 2011 (four eggs), and one in 2014 (two eggs). Additionally, although difficult to document, it is possible that abandonment due to an adult mortality could have occurred that was not observed or attributed to recreation, park operations, or other non-covered species management activities. In this HCP, it is assumed this could occur for up to one nest (or two eggs) a year. Therefore, this HCP anticipates there is potential for incidental take of up to a maximum of eight eggs in a year. In addition, because the estimate of eight eggs is likely based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years within a 5-year period will result in the maximum take levels and other years will have lower take levels. As a result, this HCP estimates that take of no more than 22 eggs will occur over a 5-year period. Due to the cryptic nature of the eggs, it is possible that additional abandonment or harm has occurred that was not observed. Therefore, this estimate is also intended to account for incidental take that may not have been detected due to their cryptic nature.

[73] It is assumed that a portion of dead or injured chicks are not detected due to chicks that are scavenged or buried prior to discovery and CLTE cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured chicks may not have been discovered in some years.

Table 4-5. Summary of Estimated CLTE Take (Park Operations, Recreation, Non-Recovery Action)	
Activities Causing Take	**5-year Running Take[1,2] of Individuals**
Park operations, recreation, and other non-recovery activities	15 adults and/or juveniles 15 chicks 22 eggs

Notes:

[1]Take estimates do not include harassment.

[2]Numbers are based on past observations of worst-case mortality, injury, capture, etc. that have rarely been observed during the timeframe from 2002 to 2023 and do not happen every year. The numbers recognize that not every egg or CLTE may be detected. The 5-year running average accounts for years in which a higher amount of take may occur to ensure such unusual events do not trigger an amendment to the HCP.

[3]This HCP does not include annual take estimates, but the annual numbers presented in the text represent a worst-case scenario. If annual take numbers approach this worst-case scenario for any life stage during any one calendar year, CDPR will initiate additional consultation with USFWS to identify additional management actions that can be implemented. That annual trigger for consultation stands at 12 adults/juveniles, 8 chicks, and 8 eggs from all covered activities other than recovery activities.

4.4.3 Anticipated Impacts of the CLTE Taking

This section describes the overall impacts of the anticipated take of CLTE within the HCP area and discusses the overall impacts from covered activities on the entire CLTE population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

As stated previously, CLTE in the HCP area are anticipated to be predominantly affected by motorized activities, and CLTE are expected to be largely precluded from successfully breeding in the HCP area where these activities occur (Map 26). Motorized activities affect CLTE by disturbing nesting and roosting birds (section 4.4.1.1.1). Therefore, in locations where motorized activities occur in the HCP area, CLTE will likely have reduced nesting attempts. Motorized activities also reduce habitat quality (e.g., removing/destroying objects such as driftwood and natural debris associated with nesting); reduce microtopographic complexity, which provides cover from predators and inclement weather; and prevent establishment of foredune vegetation, which can provide microhabitat features that can support nesting and roosting.

Non-motorized activities can also affect CLTE, including in areas where motorized recreation does not occur. CLTE will likely be precluded from successfully breeding in the HCP area where non-motorized activities occur (Map 26), depending on the type and intensity of non-motorized use. The effects of non-motorized recreation can be greater when park visitation rates are higher, such as during weekends or holidays. The effects from non-motorized activities include disturbing nesting, roosting, and foraging birds (sections 4.4.1.1.2 through 4.4.1.1.11), making it less likely that CLTE will nest in areas where non-motorized activities are present.

Since CLTE is fully protected, CDPR is preparing an NCCP to address incidental take of CLTE under CESA. Consistent with NCCP issuance criteria, the NCCP will ensure the conservation program provides a broad-based ecosystem approach to protecting habitat, natural communities, and species diversity for CLTE to offset any impacts from covered activities.

The conservation program activities proposed for coverage under this HCP have been occurring in the HCP area for various periods of time prior to HCP preparation. For example, exclosures have been used since 1991, and the current configuration of the seasonal exclosure has been used since 2004. In addition, some recreation activities (e.g., motorized and pedestrian activities) have been occurring in the

HCP for over a century (section 4.11.1). This historic, intensive use of the beaches and dunes in the HCP area likely resulted in low numbers of CLTE nesting in the HCP area long before the implementation of this HCP. Historical data indicate the HCP area likely supported very few CLTE around the time CDPR began acquiring the Oceano Dunes SVRA lands in 1974. At the time of the CLTE FESA and CESA listing as endangered in 1970, there were approximately 600 breeding pairs of CLTE nesting statewide. Early statewide survey data indicate few CLTE were nesting in the HCP area. Specifically, seven breeding pairs were found in the Oso Flaco Lake area in 1979 and 1980, two breeding pairs were found in the HCP area in 1982, and one breeding pair was found in the HCP area in 1983 (Fancher 1992).

The conservation program associated with this HCP has likely increased CLTE numbers in the HCP area from historic numbers. It has also successfully protected habitat and offset the effects of the covered activities. The conservation program is part of an ongoing program that has been particularly successful at protecting the breeding population of CLTE. This is demonstrated by looking at whether the HCP conservation program goals and objectives have been achieved, including CLTE Objective 2.1 to maintain a 5-year running average of at least 35 breeding CLTE pairs,[74] and CLTE Objective 2.2 to maintain a 3-year average of at least 0.8 fledgling per nesting pair[75] (section 5.2.1). In addition, the program has demonstrated success by increasing the number of CLTE in the HCP area compared to documented numbers prior to the conservation program's implementation.

Although the number of CLTE that breed within the HCP area varies from year to year, at least 31 to 50 breeding pairs have been estimated to be in the HCP area in the 5 years from 2019 to 2023, with a minimum average of 40 breeding pairs, thus exceeding CLTE Objective 2.1. In addition, during the period from 2005 to 2023, there were an average of 40 breeding pairs (range of 23–55). This is an increase from known historic numbers, which, although not as well documented, appeared to be much lower. For example, during the 7-year period from 1991 to 1997, which is just after the first seasonal exclosures were erected, there were an average of 4 breeding pairs (range of 0–16). In addition, from 2008 through 2016, the ongoing conservation program achieved a 3-year average reproduction rate above 1.0 fledgling per nesting pair (i.e., from 2008 to 2010, from 2010 to 2012, from 2012 to 2014, and from 2014 to 2016), which exceeds Objective 2.2 to maintain a 3-year average of at least 0.8 fledgling per nesting pair (Figure 3-7).

In contrast to the previous 10 years, the 2017 CLTE breeding season was characterized by low productivity, with the lowest hatching rate (i.e., only 65 percent of nests hatched), chick fledging rate (i.e., 0.15 fledglings per nesting pair), and number of juveniles produced (i.e., only 18 percent of chicks fledged). It is suspected that predation by striped skunk of both eggs and young chicks was a factor in the poor breeding season. Even with the poor productivity in 2017, the 3-year average from 2015 through 2017 was still 1.0 fledglings per nesting pair, which met Objective 2.2. However, for the period from 2016 through 2023 the 3-year average dropped below the 1.0 fledglings per nesting pair in all years except for the period from 2018 to 2020 when 1.04 fledged per pair. Despite the recent fledgling rate, ongoing implementation of the conservation program through this HCP is anticipated to continue providing a net benefit to CLTE and fully offset any impacts from covered activities by achieving the conservation program goals and continuing to increase or maintain a CLTE population of 35 breeding

[74] CLTE breeding numbers are calculated as a range. This number will be based on the lowest number in the range.
[75] CLTE breeding numbers are calculated as a range and; therefore, fledging rates are also calculated using a range. This number will be based on the lowest number in the range.

pairs averaged over a running 5-year window and to maintain a 3-year average of at least 0.8 fledgling per nesting CLTE pair in the future.

The CLTE colony in the HCP area is also important for the overall CLTE population in the state since loss of breeding habitat throughout the state has resulted in a fragmented population distribution and limited number of remaining breeding sites (USFWS 2006). On a regional level, there are very few active breeding sites along the central coast of California, and none remain between the HCP area and the San Francisco Bay. Within San Luis Obispo and Santa Barbara counties, there are four least tern colony sites with annual or intermittent use; all sites have management providing protective measures and monitoring. The HCP area is the only site in San Luis Obispo County. Rancho Guadalupe Dunes County Park, VSFB, and Coal Oil Point Reserve are in Santa Barbara County and approximately 7, 22, and 85 miles south of the HCP area colony, respectively. For this CLTE regional population, the HCP area has become an important source of productivity, producing approximately 2.5 times as many CLTE juveniles during the period between 2004 and 2023 than the other sites (e.g., the HCP area produced 856 juveniles while the other sites combined produced 342 to 347 juveniles).

4.5 Southwestern Pond Turtle

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects on SWPT and SWPT habitat from existing and new covered activities within suitable SWPT habitat in the HCP area are possible and are described in the following sections. Covered activities occurring outside of SWPT habitat are not anticipated to affect the species unless specifically discussed in the following sections. In addition, other covered activities that are not expected to affect SWPT are generally not discussed further. Table 4-6 summarizes the potential effects and potential take of SWPT from covered activities. AMMs that address the effects are provided in Table 5-3.

At this time, CDPR does not have a Recovery Permit that covers activities like surveying and monitoring SWPT because the species is not listed. CDPR will update the USFWS Recovery Permit to include these recovery activities the next time this permit is amended. To provide a comprehensive understanding of the conservation program, this section includes activities that would be authorized by a Recovery Permit. The effects are described in this section; however, the impacts will not be included in the ITP but rather authorized under the Recovery Permit (TE-815214-10) once it is updated to include activities for SWPT.

4.5.1 Direct and Indirect Effects

Covered activities that occur within the 254 acres of suitable SWPT aquatic habitat likely affect SWPT, as described further in the following sections. Most of the covered activities that occur within SWPT aquatic habitat likely have temporary effects (e.g., increased turbidity) on SWPT aquatic habitat. In addition, many of the covered activities likely have minor effects that will not rise to a level of take of SWPT.

Covered activities within SWPT 4,701 acres of upland habitat could likely also affect SWPT, and SWPT individuals could also wander into fully developed habitat and be at risk. Most of the covered activities that occur within SWPT upland habitat likely have minor effects, as the majority of the covered activities (e.g., motorized recreation) within SWPT upland habitat occur on beaches and dunes comprised of barren sand, which has limited value for SWPT as dispersal habitat and where SWPT have rarely been observed and are not likely to occur during dispersal events.

Some existing covered activities, including habitat management, monitoring of SWPT, control of invasive exotic aquatic species, and water quality monitoring and improvement projects, ultimately benefit SWPT

and their habitat by improving habitat quality and/or providing valuable information on SWPT occurrence in the HCP area.

The following sections describe the mechanisms by which existing and new covered activities could affect SWPT. Effects will be avoided and minimized to the extent feasible through existing and new AMMs. AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Chapter 5.

4.5.1.1 Park Visitor Activities

Park visitor activities have rarely been observed impacting SWPT and likely have minimal impacts on SWPT and SWPT habitat. Motorized recreation is not permitted in SWPT aquatic habitat, and most recreation in upland habitat occurs in lower quality SWPT dispersal habitat, including beach and dune habitat. However, in rare instances, SWPT dispersing through suitable upland habitat could be directly affected if they occur in areas used by park visitors, as discussed below.

4.5.1.1.1 Motorized Recreation (CA-1)

Motorized recreation does not affect aquatic SWPT habitat, as motorized vehicles are not allowed in SWPT aquatic habitat.

Motorized recreation is permitted in 507 acres of suitable SWPT upland habitat; however, with the exception of two incidents, effects from motorized recreation on SWPT upland habitat have not been known to have occurred in the past. In March of 2018, a rider posted on social media that he found a SWPT in an unknown location of the open riding area and moved it out of harm's way; a species expert confirmed the photos were of a SWPT (Little, S. pers. comm. 2024). In June of 2018, Resource staff found turtle tracks in the open riding area near post 3.5, and the tracks were heading into Dunes Preserve. Pictures were taken and shown to Dr. Sam Sweet, Herpetology professor at U.C. Santa Barbara, who suspected subadult SWPT (Little, S. pers. comm. 2024). Given the low quality of the open riding area as SWPT habitat, such events are expected to continue to be minimal in the future. Motorized recreation is generally limited to the beaches and dunes comprising barren sand in the HCP area and does not permanently alter beach and dune upland habitat where SWPT occur. Although these areas are considered suitable upland dispersal habitat for SWPT, this habitat is likely rarely used by SWPT for dispersal in contrast to more suitable habitats since these areas provide minimal cover and are generally inhospitable to SWPT.

Although rare, when environmental conditions are right, SWPT could disperse overland through habitat used by motorized vehicles. If SWPT did disperse through areas where motorized recreation occurs, SWPT could be struck by vehicles and injured or killed. As noted above, in 2018 a rider did report finding a SWPT in the open riding area and possible SWPT tracks were seen on a different occasion near post 3.5. However, CDPR staff have not directly observed a SWPT in the vegetation islands or in the open riding area to date, and all other documented occurrences have been directly within the vicinity of a water feature. As a result, the likelihood of vehicle strike is extremely low (see also section 4.5.1.5.1).

4.5.1.1.2 Camping (CA-2)

Camping in the open riding area is not expected to affect aquatic SWPT habitat as this typically occurs along the shoreline and open beaches, well away from any SWPT aquatic habitat. Impacts to SWPT from camping within suitable upland habitat have not been observed in the past and are anticipated to be minimal in the future. Any impacts that do occur are expected to be similar to those described above for motorized recreation (see section immediately above).

The two designated campgrounds within the HCP area are adjacent to potential SWPT aquatic habitat, including Meadow Creek, Carpenter Creek, Oceano Lagoon, and Pismo Creek. There are four

occurrences of SWPT near Oceano Campground at Oceano Lagoon with one occurrence near North Beach Campground near Pismo Creek, all recorded within the last few years (iNaturalist 2024). CDPR staff consistently saw them during exploratory surveys completed in 2024 and 2025 Activities at the campground have not been known to impact SWPT or their habitat to date. The campgrounds are close to potential SWPT aquatic habitat; however, and upland areas within the campgrounds could prove suitable for nesting or overwintering during non-peak days when disturbance is low. Such a nest or individual would be vulnerable to damage/injury or mortality, and hatchlings would be vulnerable to being crushed, captured, or other harm. In general, it is not likely that pedestrian activities at the campgrounds will cause direct mortality of SWPT individuals. Park visitors, including campers, are prohibited from collecting animals and plants and damaging park resources, although a camper might pick up a SWPT if found or accidently crush a nest hidden within a campsite. Although rare, moving vehicles in the campground could inadvertently strike a SWPT that has left the creek or lagoon and entered the campground or a hatchling leaving a nest; however, this has never been documented in the HCP area, and the likelihood of this happening in the future is low.

Indirect effects on SWPT from camping activities include an increase in trash, which could potentially boost predator populations (e.g., raccoons) and thereby incidentally increase predation on SWPT. To minimize this effect, CDPR will continue to inform all visitors that they must dispose of their trash in a trash dumpster, and CDPR will enforce rules to ensure the campsites are maintained in a clean condition. CDPR will also continue to maintain set trash service in the developed campgrounds to ensure that the trash receptacles are regularly emptied and do not overflow, attracting predators. As a result, this impact will continue to be minimal.

4.5.1.1.3 Pedestrian Activities (CA-3)

Most pedestrian-based activities are considered to have little, if any, effect on SWPT or its habitat since SWPT tend to be found in aquatic habitats less frequented by visitors. In addition, visitor activities do not result in permanent loss of aquatic or upland habitat. As a result, it is unlikely that most pedestrian activities will directly affect SWPT in the future.

Pedestrians in suitable SWPT upland habitat are unlikely to encounter a SWPT and/or kill or injure a SWPT if it is encountered, although pedestrians might pick up a SWPT if found given the species' somewhat slow speed on land. Pedestrians that cross creeks or enter lagoons could stir up sediments and produce turbid stream flow in suitable aquatic SWPT habitat. Sediment and turbidity can affect SWPT by burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by pedestrians crossing creeks or entering lagoons are largely considered to be temporary. Ponded areas of Arroyo Grande Creek and Estuary are closed to all visitors to protect tidewater goby breeding from early spring to late summer, which may also prevent disturbance of SWPT and their habitat in those areas, although the closure may be too early to protect emerging hatchlings. Pedestrians could damage or destroy a SWPT nest by stepping on it or disturb or crush emerging hatchlings. If a SWPT nest is discovered in a location that may be accessible to pedestrians, CDPR biologists will evaluate conditions to determine if monitoring is needed and whether to install protective measures to protect the nest and hatchlings. As a result, this impact will continue to be minimal.

4.5.1.1.4 Fishing (CA-5)

Nesting, Basking, and Foraging Impacts. The effects on SWPT from fishing is similar to the discussion above regarding pedestrian effects (section 4.3.1.1.3); however, impacts would not be isolated to the crossings typical of pedestrian uses. People fishing generally occupy habitat longer than pedestrians who are just passing through. All life stages of SWPT have the potential to be impacted by fishing, potentially from trampling nests within vegetated areas, disturbing aquatic and terrestrial basking activities, or

impacting aquatic foraging of juveniles and adults in aquatic habitats. SWPT occur in habitats where fishing may occur (Oceano Lagoon, Oso Flaco Lake). Fishing activities may disturb nesting and basking in upland habitats increasing the chances of predation or nest failures. No known mortalities have been reported for SWPT within the HCP area (see below regarding possible injury/mortality from entanglement). If fishing activity is observed disturbing SWPT nesting, visitors will be asked to relocate farther away from known nests incidentally found by Park staff or visitors, and fencing will be installed if needed to restrict fishing activities near nests. As a result, direct impacts to SWPT nests from fishing activities will be minimal.

Increased Predators and Entanglement. Fishing line or hooks, whether in active use or discarded, can entangle or pierce SWPT adults or juveniles. A SWPT was rescued from fishing line at Oceano Lagoon, and sent to an approved rehabilitation clinic in September 2016 (CDPR 2024c). In addition to trash, discarded fishing bait may further attract predators to SWPT habitat and thus increase predation on SWPT. To reduce this impact, CDPR will incorporate considerations for SWPT which includes encouraging and educating anglers about properly disposing of fishing lines, hooks, and bait in trash receptacles. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. As a result, this effect will be minimal.

4.5.1.1.5 Dog Walking (CA-6)

Like pedestrians, dogs have not been documented impacting SWPT, but any impacts are difficult to observe and could occur without being observed. In general, dogs wading and swimming in estuaries or creeks occupied by SWPT can affect water quality by depositing waste, trampling vegetation, and temporarily increasing turbidity, thereby temporarily affecting habitat, foraging, ability to escape from predators, and reproductive success. However, dogs will continue to be required to be on a leash no longer than 6 feet and remain under the control of an owner at all times, and mutt mitts will continue to be provided in the HCP area. As a result, impacts from dog walking are considered very minimal and will be very minimal in the future.

4.5.1.1.6 Equestrian Recreation (CA-7)

Most equestrian-based activities occur in the northern portion of the HCP area and are considered to have little, if any, effect on SWPT or its habitat since SWPT tend to be found in habitats where equestrian activity does not occur and/or habitats that are less frequented by visitors. As a result, it is unlikely that equestrian activities will directly affect SWPT in the future.

If horses cross creeks or enter lagoons that are suitable habitat for SWPT, they could stir up sediments and produce turbid stream flow in aquatic SWPT habitat. Sediment and turbidity can affect SWPT by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by horses crossing creeks or entering lagoons are largely considered to be temporary. Ponded areas of Arroyo Grande Creek and Estuary are closed to all visitors to protect tidewater goby breeding from early spring to late summer, which may also prevent disturbance of SWPT and their habitat in those areas, although the closure may be too early to protect emerging hatchlings. Horses could damage or destroy a SWPT nest near a creek crossing by stepping on it or disturb or crush emerging hatchlings. If a SWPT nest is discovered in a location that may be accessible to equestrians, CDPR biologists will evaluate conditions to determine if monitoring is needed and whether to install protective measures to protect the nest and hatchlings. As a result, this impact will be minimal.

4.5.1.1.7 Holidays (CA-10)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area on holidays. Therefore, no additional effect to SWPT occurs from motorized recreation on holidays.

Effects on holidays from non-motorized recreation are considered to be similar to those described for camping (section 4.5.1.1.2) and pedestrian activities (section 4.5.1.1.3). The increase in visitors on holidays can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on SWPT that have not previously been described.

4.5.1.1.8 Special Events (CA-11)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area during special events. Therefore, no additional effect to SWPT occurs from motorized recreation during special events. In addition, Special Event permits do not authorize activities to occur in areas that would otherwise be closed to visitors; therefore, no additional impacts from non-motorized and motorized activities occur in SWPT habitat that is typically off limits to visitors.

However, special events are potentially different from typical non-special event activities. First, many events tend to focus participants in the event area, which could mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Many special events occur during shoulder seasons and increase visitation at times when visitation would typically be lower. Effects on SWPT from concentrating spectators and vendors in an area is likely similar to the effects described for motorized recreation (section 4.5.1.1.1), camping (section 4.5.1.1.2), and/or pedestrian recreation (section 4.5.1.1.3). The increase in visitors during special events can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on SWPT that have not previously been described.

4.5.1.2 Natural Resources Management Program

4.5.1.2.1 Tidewater Goby and Salmonid Surveys (CA-13)

Occasionally, SWPT individuals could be present within tidewater goby and salmonid survey areas. If encountered unintentionally when seining or dipnetting in Arroyo Grande Creek or other non-routine surveys in aquatic habitats where SWPT may occur, CDPR biologists can affect all SWPT life stages (i.e., hatchlings, juveniles, and adults). However, fisheries biologists permitted to perform tidewater goby and salmonid surveys in SWPT habitat would conduct a visual survey for SWPT individuals prior to sampling in areas where SWPT may be present. If individuals are discovered, sampling for tidewater gobies will be conducted in a way that avoids all individuals. As a result, impacts to SWPT during tidewater goby and salmonid surveys have not occurred in the past and are not expected in the future.

As part of the USFWS 10(a)(1)(A) Recovery Permit for tidewater goby, electrofishing is not allowed during tidewater goby surveys or within tidewater goby habitat; however, electrofishing is allowed in areas upstream of tidewater goby habitat under the terms of other scientific collecting permits and authorizations and is sometimes conducted for other fisheries surveys. Consequently, although unlikely, electrofishing activities could result in injury or mortality of SWPT juveniles or adults. However, effects due to electrofishing are minimized by having a qualified biologist/Natural Resource staff conduct visual surveys as surveys are being conducted with appropriate avoidance measures if a SWPT is found in the survey area.

Fisheries surveys require biologists to stand in water and seine/dipnet or electrofish for fish. Surveys within aquatic habitats, including activities associated with salvaging stranded tidewater gobies, can

indirectly affect SWPT by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment that is stirred up during seining, electrofishing, and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect SWPT or their habitat in the long term.

Although information is currently limited on the spread of diseases affecting non-captive bred SWPT, such as respiratory disease and shell disease, fisheries biologists do follow decontamination protocols to prevent the spread of amphibian chytridiomycosis (USFWS 2005b). To the extent diseases affecting SWPT could otherwise be spread by surveys, the decontamination protocol would reduce or eliminate the risk.

To reduce predation from invasive species, qualified biologists/Natural Resource staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrogs, largemouth bass, red-eared sliders, crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on SWPT.

4.5.1.2.2 Monitoring and Management for Listed Herpetological Resources (CA-14)

Most CRLF surveys result in minimal impacts to SWPT since most surveys for CRLF are eyeshine surveys conducted from the edge of the water bodies and/or kayak and only involve visually scanning for CRLF and/or egg masses. Biologists do access CRLF survey sites via potential SWPT nesting habitat. During these surveys, care is taken not to disturb sediments or vegetation, but a SWPT nest could be crushed. CRLF surveys are conducted by a qualified biologist/Natural Resource staff. Therefore, impacts to SWPT and/or nests will continue to be minimal during surveys.

Dipnetting surveys for CRLF are infrequently conducted in the HCP area. In addition, funnel traps may be deployed to survey for SWPT. These surveys are conducted by CDPR biologists or their USFWS-approved contractors for purposes of monitoring, identification, and management of the species. CDPR biologists or their contractors could affect mobile life stages of SWPT (i.e., hatchlings, juveniles, and adults) during monitoring surveys that involve dipnetting or funnel trap surveys. During these surveys, CDPR biologists or their contractors could capture, injure, or kill a SWPT hatchling, juvenile, or adult, and biologists could inadvertently crush a nest. Similarly, pitfall traps for WSF could inadvertently trap SWPT. To reduce impacts associated with these surveys when they do occur, they will continue to be conducted by an approved biologist and will continue to be conducted in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF (USFWS 2005b). Biologists conducting herpetological surveys will all be trained in identification and avoidance measures for SWPT. Although capture of hatchling, juvenile, or adult SWPT could occur during CRLF surveys, and would also be the direct purpose of funnel trap surveys, mortality and/or injury will continue to be minimized, if not eliminated.

Dipnet surveys involve biologists standing in water. Surveys within aquatic habitats affect SWPT by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during wading and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect SWPT or their habitat in the long term.

Although information is currently limited on the spread of diseases affecting non-captive bred SWPT, such as respiratory disease and shell disease, biologists do follow decontamination protocols to prevent the spread of amphibian chytridiomycosis (USFWS 2005b, Cleveland 2023). To the extent diseases affecting SWPT could otherwise be spread by surveys, the decontamination protocol would reduce or eliminate the risk.

Impacts from surveys for listed herpetological species would typically be covered by a USFWS Recovery Permit. At this time, USFWS Recovery Permit TE-815214-10 does not include SWPT surveys. CDPR will

include SWPT in an updated recovery permit if the species is ultimately listed. Over the course of the HCP term, future impacts to SWPT from herpetological surveys will be addressed separately with the USFWS through the Recovery Permit.

4.5.1.2.3 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Only activities associated with marsh sandwort and/or Gambel's watercress are considered to have potential to impact SWPT. Listed plant monitoring, propagation, and habitat enhancement for marsh sandwort and Gambel's watercress in the HCP area to date are not known to have impacted SWPT. Monitoring of marsh sandwort and Gambel's watercress is not expected to impact SWPT since this occurs on foot by a trained botanist. Any future monitoring, propagation, and habitat enhancement activities for marsh sandwort and Gambel's watercress at Oso Flaco Lake has the potential to temporarily impact all life stages of SWPT (i.e., eggs, juveniles, and adults). Activities can result in injury or mortality if a SWPT or nest is present within the work area. In addition, activities can disturb SWPT located near the work area and cause stress or cause them to move from cover where they may be exposed to predation.

To minimize impacts to SWPT associated with these activities, depending on the type of activities (e.g., ground disturbance), surveys for SWPT are conducted within 100 feet of any propagation and habitat enhancement activities in Oso Flaco Lake to ensure no SWPT are present. If a SWPT is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the SWPT, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, mortality, injury, and disturbance to SWPT will be minimized.

Activities within aquatic habitats affect SWPT by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect SWPT or their habitat in the long term.

Ultimately, listed plant habitat enhancement at Oso Flaco Lake and in other aquatic habitat where SWPT may occur, benefits SWPT by reducing invasive plants in the area and improving habitat in the HCP area for SWPT.

4.5.1.2.4 Habitat Restoration Program (CA-16)

Habitat restoration conducted in the HCP area to date is not known to have impacted SWPT and is part of the management program offsetting the incidental take to SWPT from other covered activities; however, this management also has the potential to result in injury or mortality if a SWPT is present within the work disturbance area. Restoration can directly affect all SWPT life stages (i.e., eggs, hatchlings, juveniles, and adults), including by grading, ground disturbance with hand tools, vegetation removal and installation, and maintenance activities. In addition, activities can disturb SWPT located near the work area and cause them to move from cover where they may be exposed to predation. To minimize these possible impacts, depending on the type of activities (e.g., ground disturbance), surveys for SWPT will be conducted, as needed, to ensure no SWPT are present. If a SWPT is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or determines the activities can continue with minimal risk to the safety of the SWPT, which may include implementing additional AMMs such as exclusion fencing or biological monitoring. As a result, mortality, injury, and disturbance to SWPT will be minimized.

4.5.1.2.5 Invasive Plant and Animal Control (CA-17)

Invasive plant or animal control activities conducted in the HCP area to date are not known to have impacted SWPT. CDPR biologists can directly affect all life stages of SWPT (i.e., eggs, hatchlings, juveniles, and adults) by disturbing occupied habitat during standard invasive animal and plant control efforts. Invasive pest plant and animal control activities may require qualified biologists/Natural Resource staff or CDPR approved contractors to remove pest plants and animals in suitable SWPT aquatic or upland habitat, including moist vegetated areas that SWPT can use for dispersal. Activities like bullfrog removal can involve staff working in or adjacent to aquatic habitat which could involve the risk of crushing adults and juveniles, stirring up sediment, or crushing nests. However, pre-activity surveys will be conducted, at the discretion of a CDPR biologist, prior to commencing any activities that can disturb suitable SWPT aquatic or upland habitat to minimize effects of these activities on SWPT. If a SWPT is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue once they determine the activities can continue with minimal risk to the safety of the SWPT, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from invasive plant and animal control will be minimal.

Activities within aquatic habitats affect SWPT by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect SWPT or their habitat in the long term.

Invasive animal control may include activities like bullfrog removal or the trapping of red-eared sliders and crayfish. These activities could involve installing funnel traps, direct targeting of individuals, and other work in aquatic habitats that could result in injury or death of SWPT. Funnel traps could inadvertently trap a SWPT. Direct targeting of bullfrog could also injure or harm SWPT. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to SWPT from other covered activities; however, this management also has the potential to cause harm to SWPT. To reduce impacts associated with invasive animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for SWPT. Any take from these focused predator control activities will be described in in this HCP and not through a USFWS Recovery Permit.

Ultimately, invasive-pest plant and animal control in aquatic and/or upland habitat where SWPT may occur benefits them by reducing invasive species in the HCP area and improving their habitat. This activity more than offsets the impacts to the species by removing vegetation and/or animals that pose a threat to SWPT individuals or its habitat.

4.5.1.2.6 Water Quality Monitoring Projects (CA-19)

Water quality monitoring in the HCP area to date is not known to have impacted SWPT. Installation of water quality monitoring equipment can temporarily affect SWPT by disturbing individuals as workers enter occupied aquatic habitat. However, pre-activity surveys will be conducted prior to commencing any activities disturbing suitable SWPT aquatic habitat to minimize effects of these activities on SWPT. If a SWPT is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the SWPT, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from water quality monitoring will be very minimal.

Maintenance of water quality monitoring equipment within aquatic habitats can affect SWPT by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect SWPT or their habitat in the long term.

Future projects for water quality monitoring are not known at this time. Any future projects will be evaluated for consistency with this HCP and may be permitted under a separate regulatory process, if necessary. Improvements to water quality that result from ongoing water quality monitoring and improvement projects in occupied habitat will ultimately benefit SWPT by creating more suitable habitat within the HCP area.

4.5.1.3 Park Maintenance

4.5.1.3.1 Campground Maintenance (CA-20)

The two designated campgrounds within the HCP area are adjacent to potential aquatic habitats including Meadow Creek, Carpenter Creek, Oceano Lagoon, and Pismo Creek. There are four occurrences of SWPT near Oceano Campground at Oceano Lagoon, at least one occurrence near North Beach Campground near Pismo Creek, all recorded within the last few years (iNaturalist 2024). CDPR staff consistently saw SWPT basking in Oceano Lagoon during some exploratory surveys completed in 2024 and 2025. Campground maintenance includes mowing and other off-pavement activities that could impact dispersing or overwintering individuals or nests through direct crushing or disturbance. Maintenance vehicles at the campground can inadvertently strike a SWPT that has left the creek or lagoon and entered the campground area; however, this has never been reported in the HCP area to date. In addition, AMMs will ensure mowing is limited to the extent needed for safe public access and is limited to public use areas. If a SWPT is observed within an area subject to maintenance, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue if they determine the activities can continue with minimal risk to the safety of the individual SWPT. Other measures such as exclusion fencing, pre-activity surveys, or biological monitoring could be employed if needed. Mowing in ways that reduce mortality or injury will also be considered, such as adjusting blade heights and mowing outside of nesting times when SWPT are searching for nesting sites (May-July, typically in the early afternoon) or when hatchlings are making their way to the water (late February/early March). Lastly, all maintenance personnel will continue to receive annual training that will cover SWPT life history and work constraints. As a result, impacts from campground maintenance activities will be very minimal.

4.5.1.3.2 General Facilities Maintenance (CA-21)

CDPR maintains facilities and infrastructure that support public activities throughout the HCP area. These maintenance areas include sites like the levee and trail from Grand Avenue to Pismo Beach, underground infrastructure to support the corporation yard and developed campgrounds, fences around areas like the corporation yard, and a network of formal trails around Oceano Lagoon and the Grand Dunes. Maintenance of these facilities could include minor grading, routine vegetation control, pedestrian bridge maintenance, and other projects that could occur in or near the mapped breeding habitat for SWPT. In particular, maintenance of trails, the North Beach Campground levee, and foot bridges near the Pismo State Beach monarch grove could involve work near wetlands or areas mapped as potential breeding habitat for SWPT. This work will be infrequent, and standard AMMs will be followed including pre-project surveys as needed, timing projects to avoid critical life stages, and relocation of individuals if found in work areas.

Mechanical trash removal will not occur in aquatic habitat areas or in vegetated dunes. Therefore, SWPT in aquatic habitat will not be impacted. Due to the distance from freshwater aquatic habitat, SWPT is

not very likely to disperse through upland habitat in the geographic areas proposed for mechanical trash removal north of Post 6. Mechanical trash removal could kill or injure a SWPT if it dispersed through the area while mechanical raking was occurring. However, SWPT rarely disperse through open, barren sand areas where mechanical trash removal will occur. As a result, mechanical trash removal will be unlikely to impact SWPT.

4.5.1.3.3 Routine Riparian Maintenance (CA-26)

Riparian maintenance activities are not known to have impacted SWPT in the past. Riparian maintenance activities that can affect SWPT include the clearing of debris, vegetation, and sediment from culverts and spillways; riparian tree and shrub vegetation control (e.g., removing or trimming vegetation); and emergent and invasive species control. SWPT may occur in riparian areas where maintenance activities are located. If SWPT eggs, hatchlings, juveniles, or adults are present in the riparian maintenance area they can be directly affected by disturbance to habitat. Individuals may be disturbed by or caught in rakes or other hand equipment used to remove sediment, debris, or vegetation. Adults, juveniles, hatchlings, or eggs can also be disturbed or crushed by workers or equipment during culvert and spillway maintenance and the removal of emergent vegetation. However, culvert maintenance will be conducted during periods when individuals are unlikely to occur in the area, to the extent feasible. In addition, at the discretion of a qualified biologist/Natural Resource staff based on the likelihood of habitat supporting SWPT, the qualified biologist/Natural Resource staff will conduct a survey of the work area for SWPT within 48 hours prior to any riparian maintenance activities. If SWPT adults, juveniles, or hatchlings are observed, work will not commence until AMMs are in place. Furthermore, a biological monitor will be present, as necessary, during maintenance activities to ensure SWPT are not present while work is occurring, and any herbicides used in wetland or associated habitats will be labeled for aquatic use. As a result, direct impacts to SWPT from riparian maintenance are not expected in the future.

Riparian maintenance activities can temporarily increase turbidity because the in-stream vegetation traps and holds sediments. Temporarily suspended sediment can affect SWPT. However, sediment stirred up during activities will remain minimal, localized, and temporary. In addition, heavy equipment will not be placed in the water, and backhoe work will continue to be restricted to the roadside or upper bank with only the bucket placed in the water body. Therefore, impacts associated with suspended sediments will continue to be minimized and will not affect SWPT habitat in the long-term.

Riparian maintenance activities can affect an annual maximum of approximately 0.3 acre of wetlands for culvert cleanout, debris removal, and emergent vegetation removal. In addition, approximately 5.9 miles of riparian corridor segments will continue to be subject to tree maintenance and invasive weed control as the need arises. Maintenance of these areas will continue to reoccur over the course of the permit, as needed, when vegetation regrows. These activities can temporarily impact aquatic and/or riparian habitat available for SWPT. However, these impacts will continue to be minor, localized, and temporary.

4.5.1.3.4 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Maintenance of trail and access corridors, including boardwalks, paths, and sand ramps, is completed on an as-needed basis. The frequency of this work mainly depends on visitor use and/or any weather-related damage. Some of this work could occur near wetlands or areas mapped as potential breeding habitat for SWPT. This work will be infrequent, and standard AMMs will be followed including pre-project surveys as needed, timing projects to avoid critical life stages, and relocation of individuals if found in work areas. Vegetation intruding onto any footpaths may need to be trimmed at least once a year and is usually completed using hand tools. Vegetation trimming does not involve plant removal or disturbance of soil or aquatic habitat where SWPT may occur; thus, vegetation trimming is unlikely to affect SWPT habitat or individuals. Any effects on SWPT aquatic habitat during boardwalk maintenance

will continue to be minor and temporary, and potential for direct impacts to individuals will continue to be low.

4.5.1.4 Visitor Services

4.5.1.4.1 Emergency Response (CA-33)

It is necessary from time to time for law enforcement and/or medical aid to respond to an emergency that is located off a designated trail. When this occurs, there can be some trampling of vegetation near an aquatic resource or a creek might be crossed without the use of a bridge or hardened bottom. These activities can result in damage to SWPT habitat. This damage is difficult to document; however, damage to habitat is considered to be minor and temporary.

Emergency vehicle direct impacts to SWPT are difficult if not impossible to document since emergency response must be implemented immediately and quickly. It is possible that eggs, hatchlings, juveniles, or adults can be directly affected by such an incident by being struck/crushed by a vehicle. This will especially be true for vehicles that need to drive above the 15-mph speed limit to respond to an emergency.

Emergency response activities that cross creeks can temporarily stir up sediment and increase turbidity. Sediment stirred up during activities is localized and temporary (lasting only during the emergency action) and therefore, will not affect SWPT habitat in the long term.

4.5.1.4.2 Access by Non-CDPR Vehicles (CA-34)

Non-emergency non-CDPR vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline, following all applicable speed limits. Such vehicles do not enter the Exclosures or Oso Flaco area where vehicles are prohibited. Given the focused purpose such staff have when entering the HCP area, Impacts from their vehicles are likely less than those of motorized recreation. Effects from emergencies associated with non-CDPR vehicles, however, are similar to those effects described for CA-33, and CDPR is not always able to train non-CDPR responders. Therefore, given the travel speeds sometimes necessary for emergency response, some vehicle strikes or other harm may not be avoided.

4.5.1.4.3 Pismo State Beach Golf Course Operations (CA-37)

SWPT has been observed near Oceano Lagoon and at Pismo Creek, and thus has a low to moderate potential to occur in nearby Meadow Creek and Carpenter Creek, both of which are adjacent to Pismo State Beach Golf Course. SWPT may disperse to Meadow Creek, Carpenter Creek, and/or the golf course ponds. If SWPT disperse through the golf course to reach these locations, golf course operations and maintenance activities, such as golf cart traffic and mowers, can potentially strike SWPT individuals and injure or kill them. Maintenance activities and golf cart traffic is unlikely to affect SWPT because of the infrequency with which SWPT is expected to occur within these areas. Additionally, the low grass height at the golf course makes it easier for equipment operators and golf cart traffic to spot and avoid a SWPT.

Maintenance of water features in the golf course can potentially disturb all life stages (i.e., eggs, hatchlings, juveniles, adults) of SWPT during emergent vegetation trimming and removal or repair of bridges, although the species has never been observed within the golf course or its water features. Further, most vegetation trimming is conducted by hand. In addition, if determined to be necessary by a CDPR biologist (e.g., there is previous evidence of SWPT activity from surveys), pre-activity surveys will be conducted prior to commencing any activities that may disturb suitable SWPT aquatic habitat to minimize effects of these activities on SWPT. If a SWPT is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the SWPT, which may include implementing

AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, direct impacts from aquatic maintenance activities will be reduced or eliminated.

Activities within the golf course ponds can affect SWPT by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during activities is localized and temporary and will not affect SWPT habitat in the long term.

4.5.1.5 Other HCP Covered Activities

4.5.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Carpenter Creek may provide suitable habitat for SWPT, although focused surveys have not been performed to confirm if SWPT are present. If present, SWPT could be inadvertently struck by a vehicle crossing the creek; however, vehicle operators will continue to be encouraged to cross in areas with low or no flow, and all vehicles will continue to be required to travel at a speed of 15 mph or less. Therefore, effects on SWPT from vehicles crossing Carpenter Creek are anticipated to be minimal in the future even if a SWPT is observed in the creek.

Vehicles crossing aquatic SWPT habitats affect SWPT by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during vehicle crossings will be localized and temporary and will not affect SWPT habitat in the long-term.

SWPT have not been observed in Arroyo Grande or Oso Flaco Creek where vehicles cross since vehicles cross the creeks near the shoreline where the water salinity is too high for SWPT to persist. Although it is unlikely, it is possible that SWPT could be washed out of inhabited areas along with storm debris and end up on the beach and near creek crossing locations in the future. As a result, although no effects from vehicle crossings are considered to have occurred in these areas, and none are anticipated at these locations in the future, the possibility exists for future impact.

4.5.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

The Pismo Creek Estuary seasonal floating bridge has not been installed at this time. The floating bridge at Pismo Creek Lagoon has a small potential to impact SWPT, particularly at the northern access point. However, to date, SWPT are only known from areas farther upstream of the CDPR-owned portions of Pismo Creek (i.e., outside the HCP area). Furthermore, the Pismo Creek Lagoon is considered low quality suitable habitat for SWPT due to the intrusion of saltwater. Therefore, there is low potential for SWPT to be present in the area where the floating bridge would be installed. As a result, impacts associated with the floating bridge are unlikely.

Construction activities within Pismo Creek could affect SWPT by temporarily stirring up sediment and increasing turbidity. However, caution will be taken not to stir up sediment and any sediment stirred up during activities will be minimal, localized, and temporary and will not affect SWPT habitat upstream of the project area.

4.5.1.5.3 Dust Control Activities (CA-44)

Some dust control activities are currently occurring in the HCP area, and additional dust control activities are anticipated as future activities. Future dust control activities will not occur in SWPT aquatic habitat.

Future dust control activities could include planting vegetation in upland SWPT habitat. Additional upland habitat will continue to be affected by air quality monitoring equipment installation. This habitat will vary in its suitability for SWPT dispersal since it could occur within upland habitat anywhere within the foredunes and/or backdunes. Impacts to SWPT were not observed during previous dust control

activities. It is unlikely, but possible, that SWPT will disperse through or be found in open sand areas prior to vegetation or monitoring equipment being installed. Individuals in a dust control work area could be injured or crushed. However, additional dispersal habitat will continue to be available in the HCP area outside the dust control areas. CDPR will implement AMMs for SWPT, as appropriate, including conducting pre-activity surveys as necessary and postponing activities until appropriate AMMs are implemented (e.g., relocation, exclusion fencing, biological monitoring) or a qualified biologist/Natural Resource staff determines the activities can continue with minimal risk of harm. As a result, impacts to aestivating or dispersing SWPT are expected to be very minimal. In addition, vegetation planted for dust control activities provides necessary cover for SWPT if they are dispersing through the area and would benefit SWPT.

4.5.1.5.4 Cultural Resources Management (CA-45)

To date, cultural resource management has not resulted in impacts to SWPT. If a new cultural site is found, impacts from cultural resource management would be similar to those described for general facilities maintenance (section 4.5.1.3.2), and AMMs are expected to avoid incidental take.

4.5.1.5.5 CDPR Management of Agricultural Lands (CA-46)

Two ditches associated with agricultural lands contain runoff from the agricultural lands and flow to Oso Flaco Lake. SWPT have not been found within the agricultural ditches; however, SWPT adults could be present in these areas in the future and activities could disturb or injure/kill an individual (e.g., when equipment is used to remove sediment, debris, or vegetation). CDPR will implement AMMs, including conducting activities during low flow periods (if feasible), having a qualified biologist/Natural Resource staff conduct a focused survey of the work area (subject to their discretion), and having a qualified biologist/Natural Resource staff present (if necessary), to reduce the potential to disturb, injure, or kill SWPT. As a result, this impact will be minimal.

4.5.1.5.6 Oso Flaco Lake Boardwalk Replacement (CA-48)

The Oso Flaco Lake boardwalk may eventually need to be replaced with a comparable boardwalk in roughly the same location. Most of the boardwalk is within upland habitat, but approximately 1,000 feet of the existing Oso Flaco Lake boardwalk occurs within aquatic habitat. The boardwalk also includes two resting areas/viewing platforms within aquatic habitat. The layout and/or location of the new boardwalk might need to shift slightly to accommodate conditions at the time of replacement such as changes in codes or other operational or design considerations. Thus, although it is anticipated the replacement boardwalk will be located in roughly the same location, the HCP includes the loss of up to 1.5 acres of SWPT habitat. Depending on the type of repair, existing piles may need to be removed and new piles may be installed. Replacing the entire boardwalk will cause temporary disturbance of SWPT aquatic habitat including substantial, but temporary, turbidity and could include pile driving and a boat or floating platform to ferry supplies. Although Oso Flaco Lake is large enough that SWPT could move away from the area during construction, gravid females are highly sensitive to disturbance and could abandon nests prior to completing egg laying. Pre-activity surveys will be conducted prior to commencing any activities disturbing suitable SWPT habitat to minimize effects of these activities on SWPT. If a SWPT is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the SWPT, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, avoiding pile driving during late afternoon and evening hours, and/or biological monitoring. The timing and methodology of pile removal and installation will be optimized as feasible to minimize risk to overwintering and breeding adults and avoid nests and hatchlings. As a result, impacts from Oso Flaco Lake boardwalk replacement will be minimized.

As noted, this activity has the potential to stir up sediment and cause turbidity in the lake. It is not known how much turbidity could impact resident SWPT. A project of this scale will trigger various permits from regulatory agencies including the U.S. Army Corps of Engineers and the Regional Water Quality Control Board. CDPR will follow the requirements of those permits and implement any best management practices needed to reduce the impacts from sediment from pile removal and replacement on aquatic organisms in Oso Flaco Lake, including SWPT.

4.5.1.5.7 Special Projects (CA-49)

Specific special projects or project designs are not known at this time. Any special projects, such as the replacement or expansion of existing facilities or the construction of new facilities will directly affect SWPT habitat if the special project occurs within SWPT habitat. Effects of special projects in SWPT upland habitat, such as installing a new vault toilet, will be similar to those discussed in dust control activities (section 4.5.1.5.3). No special projects will occur in aquatic habitat or near enough to aquatic habitat to have an effect on SWPT or suitable aquatic habitat.

4.5.1.5.8 Use of Pesticides (CA-51)

Pesticides are currently used in the HCP area in upland and near aquatic habitat; however, the effects of pesticides on SWPT are not well documented (USFWS 2023a). As a result, this section discusses potential effects that could occur to SWPT.

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, there is potential for indirect effects in virtually all groups of non-target organisms. Applications of any effective herbicide are likely to alter vegetation structure within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species; moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general; rather, any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation. In the context of the HCP area, the majority of pesticide use comprises herbicides targeting invasive species, improving habitat for native species.

Very few, if any, pesticides are tested for toxic effects to reptiles. EPA has not evaluated the effects of pesticides used within the HCP area on SWPT (EPA 2024). Most studies look at mammals, birds, fish, and insects. As a long-lived species with a generalist diet, SWPT can bioaccumulate contaminants. This trait makes SWPT a key indicator of exposure to environmental contaminants (Meyer, et al. 2016); the effects of this bioaccumulation require further research beyond the scope of this HCP. Rather, this section provides a description of the location where each pesticide is used in the HCP area in relation to SWPT habitat, the pesticide's toxicity, and the potential for adverse effects of each pesticide on SWPT.

Glyphosate is proposed to be used in upland habitats and aquatic formulations of Glyphosate (Rodeo® and Aquamaster®) are proposed to be used in aquatic habitats within the HCP area for control of invasive plants, including within SWPT breeding and dispersal habitat. Glyphosate toxicity data for reptiles is lacking. EPA uses toxicity data from avian receptors as a surrogate for herptiles in terrestrial environments (EPA 2008). These studies showed that glyphosate is slightly toxic to the selected avian species, with the lowest LD50 value (i.e., dose required to kill 50 percent of a population of test animals) reported as ingestion of greater than 3,196 mg of active ingredient per kilogram of body weight (EPA 2008); however, no mortalities occurred in any of the studies, so this number is likely to be strongly conservative.

Fluazifop-P-butyl has been rated as highly toxic to aquatic and terrestrial amphibians (White 2007); effects on reptiles are not known. However, CDPR does not use Fluazifop-P-butyl near aquatic systems in the HCP area; it is only used for spot treatment in terrestrial habitats when Russian wheatgrass, veldt grass, and European beach grass are intermixed with native plants. Contractors only apply Fluazifop-P-butyl when wind speeds are low (less than 10 mph) and rain is not predicted in the next 48 hours. As a result, effects from Fluazifop-P-butyl on SWPT aquatic habitat are not expected. SWPT aestivating or dispersing within terrestrial treatment areas could be exposed.

The aquatic formulation of imazapyr (Habitat®) is proposed to be used adjacent to aquatic habitats, including SWPT breeding habitat, in the HCP area to control invasive plants once an APAP is issued. The EPA's 2007 risk assessment indicates that no direct effects are expected on either the aquatic or terrestrial phases of SWPT from imazapyr (EPA 2007). There are also no indirect effects expected for SWPT through direct effects to either its terrestrial or aquatic food sources. The effects determination for direct effects on SWPT and for indirect effects through food sources is "no effect." Some indirect effects to SWPT may occur due to direct effects on habitat and/or primary productivity (i.e., ecosystem structure and function for both the aquatic plant community and riparian vegetation).

Triclopyr is used to treat Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near SWPT breeding habitat. Given that no scientifically valid triclopyr toxicity data are available for reptiles, freshwater fish data were used as a surrogate to estimate direct acute and chronic risks to SWPT. Freshwater fish toxicity data were also used to assess potential indirect effects of triclopyr to SWPT. The EPA's 2009 risk assessment on triclopyr indicates that no direct effects are expected on either the aquatic or terrestrial phase of SWPT from triclopyr (EPA 2009). Effects on freshwater fish resulting from exposure to triclopyr indicate SWPT may be indirectly affected via reduction in available food.

Aminocyclopyrachlor is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near SWPT breeding habitat. The EPA (2010) classifies aminocyclopyrachlor as practically non-toxic or only slightly toxic to mammals, birds, fish, and aquatic invertebrates (SERA 2012). There is no information regarding the toxicity of aminocyclopyrachlor to aquatic-phase amphibians. In view of this lack of data, the EPA follows a standard approach in that freshwater fish (i.e., rainbow trout and bluegill sunfish) are used as surrogates for aquatic phase amphibians. No toxicity data are available for terrestrial-phase herptiles, so no dose-response can be derived (SERA 2012).

Chlorsulfuron is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near SWPT breeding habitat. No ecotoxicity studies have been conducted for the effects of Chlorsulfuron on reptiles, but it has been found not to pose a risk to fish or aquatic invertebrates from direct spray, off-site drift, or surface runoff (ENSR International 2005). It has been found to have a very low potential to cause adverse effects in aquatic animals (SERA 2004) and has been rated as practically non-toxic to aquatic amphibians (White 2007).

Aminopyralid is used to control Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near SWPT breeding habitat. No reptile effect studies have occurred. Only one study on the effects of Aminopyralid on amphibians has been conducted, which indicated that leopard frog larvae are no more sensitive to aminopyralid than fish (SERA 2007). Aminopyralid has been shown to be practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates. There are no known acute or chronic risks to non-target endangered or non-endangered fish, birds, wild mammals, terrestrial and aquatic invertebrates, algae, or aquatic plants (EPA 2005).

Sethoxydim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, SWPT in aquatic habitat are not impacted. Neither the published literature nor the EPA files include data regarding the toxicity of sethoxydim to reptile species. Sethoxydim is moderately to slightly toxic to fish (SERA 2001). The acute static LC50 values for technical grade sethoxydim range from 170 to 265 parts per million (mg/L) in bluegill sunfish and rainbow trout, respectively (BASF 1982 as cited in (SERA 2001). The formulated product, Poast®; however, is much more toxic with LC50 values of 2.6 ppm in bluegill sunfish and 1.2 ppm in rainbow trout (Bowman and Howell 1991 as cited in (SERA 2001). The higher toxicity in Poast® is likely attributable to the presence of naphtha solvent. However, SWPT in upland habitat are unlikely to be impacted since they only occur in upland habitat during dispersal events.

Clethodim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, SWPT in aquatic habitat are not impacted. There is no information regarding the toxicity of clethodim to reptiles or terrestrial-phase amphibians in the open literature or in the available EPA studies (SERA 2014). In the absence of information on terrestrial-phase herptiles, the EPA uses birds as a surrogate. Clethodim is practically non-toxic to birds.

VectoBac G is applied by helicopter over large areas in the HCP area, which could include occupied SWPT aquatic and upland habitat. VectoBac G is toxic only to the larvae of certain diptera. It does not directly or indirectly harm other aquatic, marine, or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® or Renegade EA® on SWPT. The product safety data sheets state that these products have not been classified as environmentally hazardous (Wilbur-Ellis 2016a, 2016b). However, one study found that glyphosate-surfactant mixtures, such as Competitor®, were more toxic to western toad than glyphosate alone (Vincent and Davidson 2015). CDPR will use only herbicides that are approved for aquatic use in aquatic habitats, including SWPT breeding habitat.

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area is expected to benefit SWPT by preventing invasive plants from taking over SWPT habitat or providing hiding places for predators. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to covered species are expected to decrease with increasing distance away from the treated field or site of application. CDPR takes extra precautions when applying pesticides near open water and wetlands and other sensitive habitats that support covered species. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Table 5-4 reduce or eliminate these impacts.

4.5.2 Anticipated Take of Southwestern Pond Turtle

This section quantifies the potential for incidental take of SWPT due to the effects described in the preceding sections. Although many of these covered activities described are currently occurring in the HCP area, very little is known about the actual impacts on SWPT since SWPT take associated with park visitor activities has rarely been observed and relatively few SWPT have ever been documented in the HCP area. The number of SWPT that may be killed or injured because of covered activities is difficult to quantify for the following reasons: 1) the number and location of SWPT within a population vary from

year to year; and 2) the largely aquatic nature of SWPT, and the relatively small body size of juveniles and eggs of SWPT, makes finding a dead or injured SWPT of younger life stages unlikely. Therefore, this HCP attempts to quantify take levels (i.e., harm, pursue, wound, kill, trap, capture or collect, or to attempt to engage in these activities) in the HCP area that could occur and go undetected, especially given the low abundance of SWPT in the HCP area and the difficulty in finding them.

Table 4-6 presents threshold levels of SWPT adults/juveniles, hatchlings, and eggs that may be detected as killed or injured over the permit term due to covered activities (referred to as "non-recovery" activities/actions) not specific to recovery activities that would be authorized under a Recovery Permit. These threshold levels represent limits for take from covered activities. The HCP also recognizes that for every SWPT found dead or injured, other individuals may be killed or injured that are not detected. As a result, the estimation of take is considered a worst-case scenario and is not expected to occur in most years, if at all.

CDPR has few records of SWPT take in the HCP area to date. Take may occur as a result of covered activities in suitable SWPT upland habitat and during covered activities within suitable SWPT aquatic habitat (Map 28). Although AMMs will be implemented to minimize take, a small amount of take may occur incidental to these activities.

Appendix C describes possible impacts to SWPT from surveys and other recovery activities that will be authorized by an updated USFWs Recovery Permit if the species is ultimately listed.

SWPT have the potential to inhabit most perennial and intermittent waters within the HCP area, and they may inhabit additional aquatic areas subject to park visitor activities, park maintenance, visitor services, and other HCP covered activities. SWPT are not known to travel long distances from their aquatic habitats even for nesting (estimated to be up to 500 meters, see section 3.3.3.3). SWPT is only anticipated to rarely occur in the upland habitat in the HCP area during nesting and dispersal and will likely stay in vegetated areas that are off-limits for OHV activity. Most upland areas within covered activities are dominated by beaches and barren sand that do not provide habitat features necessary for SWPT nesting and other uses. Specific existing and/or new park visitor activities, park maintenance, visitor services, and other HCP covered activities that could affect SWPT include the following:

- Motorized activities (CA-1)
- Camping (CA-2)
- Pedestrian activities (CA-3)
- Fishing (CA-5)
- Dog Walking (CA-6)
- Equestrian recreation (CA-7)
- Holidays (CA-10)
- Special events (CA-11)
- Listed plant management (CA-15)
- Habitat restoration program (CA-16)
- Invasive plant and animal control (CA-17)
- Water quality monitoring projects (CA-19)
- Campground maintenance (CA-20)

- General facilities maintenance (CA-21)
- Routine riparian maintenance (CA-26)
- Boardwalk and other pedestrian area maintenance (CA-31)
- Emergency response (CA-33)
- Access by Non-CDPR Vehicles (CA-34)
- Pismo State Beach Golf Course operations (CA-37)
- Motorized crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
- Pismo Creek estuary seasonal (floating) bridge (CA-41)
- Dust control activities (CA-44)
- Cultural resource management (CA-45)
- CDPR management of agricultural lands (i.e., drainage ditch maintenance) (CA-46)
- Oso Flaco Lake boardwalk replacement (CA-48)
- Special projects (CA-49)
- Use of pesticides (CA-51)

Additionally, up to 1.5 acres of SWPT aquatic habitat could be permanently affected by the replacement of the Oso Flaco boardwalk and viewing platform at Oso Flaco Lake, and up to 35 acres of upland habitat could be affected by special projects (Table 4-7). Some additional upland areas could be closed for dust control planting, but all such vegetation ultimately benefits SWPT as it converts open sand to a more hospitable vegetated habitat and is not considered habitat loss. A maximum of 1.0 acre of wetland and open water habitat will continue to be temporarily impacted each year by routine riparian maintenance, Pismo State Beach Golf Course maintenance, and/or CDPR management of agricultural lands drainage ditch maintenance, and up to 3 acres may be modified at any given time for temporary air quality monitoring equipment (Table 4-7). Additionally, a maximum of 2.0 acres of riparian corridor segments will be subject to temporary spot treatments for continued tree maintenance and invasive weed control as the need arises during the life of the HCP. This short-term disruption of habitat will not result in a permanent reduction of habitat but may increase disturbance and/or the potential for mortality of SWPT that could inhabit the disturbed area.

In addition to SWPT habitat loss, this HCP proposes take coverage for SWPT adults, juveniles, and hatchlings in aquatic and upland habitat. As stated previously, CDPR has two records of SWPT take in the HCP area to date, including a 2016 incident in which a SWPT was rescued from fishing line. Take of SWPT in the HCP area is difficult to quantify due to the limited data on SWPT presence in the HCP area and the size and somewhat cryptic nature of individuals. While numerous incidental observations of SWPT adults/juveniles have been recorded in or within close proximity to the HCP area, these occurrences are within aquatic sites and vegetated habitats that are off-limits to OHV activity and where only a limited extent of covered activities may occur. The potential for take in upland habitat is considered low, but SWPT could occur within areas open to motorized recreation. Additionally, since SWPT occurs in Oceano Lagoon, SWPT potentially could occur in Meadow Creek, Carpenter Creek, the adjacent Pismo State Beach Golf Course, and North Beach/Oceano Campgrounds. SWPT could be crushed or injured by campground or golf course management, such as mowing, or park visitor vehicles could crush or injure SWPT in the campground area. Since SWPT generally does not travel very far (less than 500m) from a water source for nesting, it is expected that nesting outside of vegetated areas would be a rare

occurrence, and potential for impacts to eggs in upland habitats would be low. AMMs, including environmental awareness training for golf course maintenance staff, will reduce the potential for SWPT incidental take.

SWPT are likely to inhabit areas subject to measures intended to benefit SWPT and other covered species, including Invasive pest plant and animal control (CA-17). While most recovery activities will be authorized by a future amendment to the USFWS Recovery Permit as outlined in Appendix C, there is the potential for incidental take to SWPT from listed plant management, invasive animal control activities, and water quality monitoring. Listed plant monitoring, propagation, and habitat enhancement and water quality monitoring may involve working in the water or on adjacent banks and upland habitat with the potential for crushing nests or individuals and sediment impacts. These activities will be conducted in coordination with qualified biologists/Natural Resource staff to ensure AMM implementation. Invasive plant and animal control may disturb occupied habitat and include activities like bullfrog removal or the trapping of red-eared sliders and crayfish. These activities may involve installing funnel traps, direct targeting of individuals, and other work in aquatic habitats that could result in injury or death of SWPT. Funnel traps could inadvertently trap a SWPT. Direct targeting of bullfrog could also injure or harm SWPT. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to SWPT from other covered activities; however, this management also has the potential to cause harm to SWPT. To reduce impacts associated with invasive animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for SWPT. Any take from these activities will be covered as described in this HCP and not through a USFWS Recovery Permit.

Only a small portion of SWPT in the HCP area are anticipated to be injured or killed due to covered activities. However, as stated previously, this HCP provides a worst-case estimate of take to account for individuals that may not have been observed injured or dead in the past. Actual take is expected to be substantially lower in most years given the marginal quality of many aquatic and upland habitats within the HCP area and the AMMs that will be implemented. Therefore, this HCP estimates that a maximum of 4 adults/juveniles, 10 hatchlings, and 20 eggs could be crushed, injured, or killed in a worst-case year due to covered activities. Because SWPT are not likely to be injured or killed each year, this HCP provides an estimate of SWPT that could be crushed, injured, or killed over the permit term. As a result, this HCP estimates that a maximum of 8 SWPT adults/juveniles, 30 hatchlings, and 50 eggs could be injured or killed due to covered activities over the permit term. Additionally, over the term of the HCP, CDPR anticipates handling up to 50 individuals (adults/juveniles/hatchlings) to relocate them out of harm's way and into suitable habitat. This non-lethal take is intended to protect the species over the HCP term. Anticipated take thresholds are provided in Table 4-6.

Table 4-6. Summary of Estimated Southwestern Pond Turtle Take

Activities Causing Take	Estimated SWPT Take over the Permit Term[1]
All covered activities in aquatic and upland habitat other than recovery activities	8 adults/juveniles 30 hatchlings 50 eggs
SWPT Capture and Relocation – non-lethal take only	50 adults/juveniles/hatchlings

Note:

[1]This HCP does not include annual take estimates, but the annual numbers presented in the text represent a worst-case scenario. If annual take numbers approach this worst-case scenario for any life stage during any one calendar

Table 4-6. Summary of Estimated Southwestern Pond Turtle Take	
Activities Causing Take	**Estimated SWPT Take over the Permit Term[1]**
year, CDPR will initiate additional consultation with USFWS to identify additional management activities that can be implemented. That annual trigger for consultation stands at 4 adults/juveniles, 10 hatchlings, and 20 eggs from all covered activities other than recovery activities.	

Table 4-7. Summary of Estimated Loss of Southwestern Pond Turtle Habitat		
	Annual estimated *temporary* habitat disruption	**Total estimated *permanent* loss of habitat**
Pond turtle aquatic habitat	3.0 acres riparian, wetland, and open water	1.5 acres – Oso Flaco boardwalk replacement
Pond turtle upland habitat	0	3 acres – dust control monitoring devices 35 acres – special projects

4.5.3 Anticipated Impacts of the Southwestern Pond Turtle Taking

This section describes the overall impacts for the anticipated take of SWPT within the HCP area and discusses the overall impacts from covered activities on the entire SWPT population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

As noted in USFWS (2023a) SWPT are currently threatened by human activities, including habitat loss, habitat fragmentation, drought, and predation by animals (e.g., bullfrogs, bass, raptors, canids, bears, raccoons, etc.) as documented in many literature accounts, e.g., Reese (1996), Madden-Smith (2005), and Holland (1994). These factors have resulted in the isolation and fragmentation of habitats within many watersheds, often precluding dispersal between sub-populations and jeopardizing the viability of metapopulations. The fragmentation of existing habitat and the continued colonization of existing habitat by invasive species may represent the most significant current threat to SWPT.

Within the HCP area, SWPT has been found incidentally at Oso Flaco Lake, Arroyo Grande Creek, Jack Lake, Oceano Lagoon, and near Pismo Creek. It is assumed that SWPT may occupy other aquatic habitats within the HCP that have not yet been documented. No presence/lack of presence surveys have been conducted in the HCP area, and no population assessments have been performed in areas where SWPT occur.

The permanent loss of less than one percent of modeled suitable aquatic and upland habitat within the HCP area resulting from covered activities will not substantially affect the species' population and distribution on site. Within the HCP area, CDPR will limit encroachment, when necessary, by closing suitable SWPT habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential SWPT habitat. CDPR will also continue to remove invasive plant and animal species, as feasible, within aquatic habitat for SWPT to benefit this species. As a result, suitable habitats for SWPT will continue to be present within the HCP area, and SWPT is still expected to occur within these habitats. In addition, Arroyo Grande Creek and Estuary and other aquatic habitat within the HCP area

will continue to provide connectivity of aquatic habitats in San Luis Obispo County and allow for dispersal opportunities in the area.

Although this HCP includes mortality or injury of up to 8 adults/ juveniles, 30 hatchlings, and 50 eggs from all HCP-covered activities, over the life of the permit, this take number is a worst-case scenario, and this amount of take is unlikely to occur based upon the few documented sightings of SWPT within the HCP area and implementation of AMMs (Table 5-4). It is unknown if stable population sizes exist at sites where SWPT has been incidentally observed within the HCP area. CDPR will conduct surveys for SWPT in the HCP area to monitor for changes in the population size or habitat and ensure that measures are in place to avoid impacts to this species. As a result, SWPT within the HCP area will not be substantially affected. In addition, SWPT populations are not expected to be affected over the species' much larger range in California.

Additionally, conservation goals and objectives listed in section 5.2.4 and AMMs will contribute toward recovery of SWPT populations. Specifically, Goals 2 through 4 are designed to not only protect but also restore aquatic habitats and associated uplands. The focus of the conservation program is 1) protecting existing populations by reducing threats; 2) restoring and creating habitat that will be protected and managed in perpetuity; 3) surveying and monitoring populations. For example, by meeting Objective 3.1, CDPR will minimize non-native aquatic predator expansion and reduce existing non-native predator populations. Successful implementation of these goals and objectives will fully offset potential take.

Objective 3.1 incorporates invasive predator control activities to offset any take of SWPT adults/juveniles/hatchlings. Specifically, CDPR is proposing to remove bullfrogs as described in section 5.3.2.1.2 to compensate for observed SWPT injury or mortality. This Invasive animal control will be focused in habitat areas where there will be maximum benefit to SWPT (high quality habitat with fewer threats or areas of potential expansion). Additionally, when possible, injured SWPT and eggs will be transferred to a wildlife rehabilitation facility. This invasive animal control and rehabilitation will be done in combination with other activities that preserve and enhance existing aquatic habitats and address known and emerging threats to SWPT from covered activities under an adaptive management program focused on SWPT conservation. This combination of AMMs, adaptive management, habitat enhancement, invasive animal control, and management of threats will fully offset the requested take and will allow existing SWPT populations to thrive within the HCP covered lands.

4.6 California Red-Legged Frog

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects on CRLF and potential CRLF habitat from existing and new covered activities within suitable CRLF habitat in the HCP area are possible and are described in the following sections. Covered activities occurring outside of CRLF habitat are not anticipated to affect the species unless specifically discussed in the following sections. In addition, other covered activities that are not expected to affect CRLF are generally not discussed further. Table 4-8 in section 4.6.2 summarizes the potential effects and potential take of CRLF from covered activities. AMMs that address the effects are provided in Table 5-5. Effects from activities covered by the USFWS Recovery Permit are outlined in this section; however, those impacts will not be included in the ITP but rather under the Recovery Permit (TE-815214-10).

4.6.1 Direct and Indirect Effects

Covered activities that occur within the 178 acres of suitable CRLF aquatic habitat likely affect CRLF, as described further in the following sections. Most of the covered activities that occur within CRLF aquatic habitat likely have temporary effects (e.g., increased turbidity) on CRLF aquatic habitat. In addition, many of the covered activities likely have minor effects that won't rise to a level of take of CRLF.

Covered activities that occur within 4,777 acres of suitable CRLF upland habitat (i.e., almost all of the 4,827 acres of mapped CRLF upland dispersal habitat in the HCP area) likely also affect CRLF, and CRLF individuals could also wander into fully developed habitat and be at risk. Most of the covered activities that occur within CRLF upland dispersal habitat likely have minor effects, as the majority of the covered activities (e.g., motorized recreation) within CRLF upland habitat occur on beaches and dunes comprised of barren sand, which has limited value for CRLF as dispersal habitat and where CRLF have rarely been observed and are not likely to occur during dispersal events.

Some existing covered activities, including habitat management, monitoring of CRLF, and water quality monitoring and improvement projects ultimately benefit CRLF and their habitat by improving habitat quality and/or providing valuable information on CRLF occurrence in the HCP area.

The following sections describe the mechanisms by which existing and new covered activities could affect CRLF. Effects will be avoided and minimized to the extent feasible through existing and new AMMs. AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Chapter 5.

4.6.1.1 Park Visitor Activities

Park visitor activities have not been observed impacting CRLF and likely have minimal impacts on CRLF and CRLF habitat. Specifically, more impactful forms of recreation (e.g., motorized recreation) are not permitted in CRLF aquatic habitat, and most recreation that occurs in upland habitat occurs in lower quality CRLF dispersal habitat, including beach and dune habitat. However, in rare instances, CRLF dispersing through suitable upland habitat could be directly affected if they occur in areas used by park visitors, as discussed below.

4.6.1.1.1 Motorized Recreation (CA-1)

Motorized recreation does not affect aquatic CRLF habitat, as motorized vehicles are not allowed in CRLF aquatic habitat.

Motorized recreation is permitted in 1,407 acres of suitable CRLF upland habitat; however, the effects of motorized recreation on CRLF upland habitat are not known to have occurred in the past and are expected to continue to be minimal in the future. Motorized recreation is generally limited to the beaches and dunes in the HCP area and does not permanently alter beach and dune upland habitat where CRLF occur as these areas are comprised of barren sand. Although these areas are considered suitable upland dispersal habitat for CRLF, this habitat is likely rarely used by CRLF for dispersal over more suitable habitats since these areas provide minimal cover and are generally inhospitable to CRLF.

Although rare, when environmental conditions are right, CRLF could disperse overland through habitat used by motorized vehicles. These dispersal movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors (Bulger, Scott and Seymour 2003). Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions (USFWS 2002). Although CRLF are rarely expected to disperse through the upland habitat where motorized recreation occurs, this behavior has been observed in the Guadalupe National Wildlife Refuge (section 3.3.3; (Cleveland 2014), which is directly south of the HCP area. If CRLF did disperse through areas where motorized recreation occurs, CRLF could be struck by vehicles and injured or killed. However, CDPR staff have not observed a CRLF in the vegetation islands or in the open riding area to date. In addition, CRLF would most likely disperse through these types of upland habitat at night and during rain events, when motorized recreation tends to be low. As a result, the likelihood of this happening is extremely low.

4.6.1.1.2 Camping (CA-2)

Camping in the open riding area is not expected to affect aquatic CRLF habitat as this typically occurs along the shoreline and open beaches, well away from any CRLF aquatic habitat. Impacts to CRLF from camping within suitable upland habitat have not been observed in the past and are anticipated to be minimal in the future. Any impacts that do occur are expected to be similar to those described above for motorized recreation (section 4.6.1.1.1).

The two designated campgrounds within the HCP area are adjacent to Meadow Creek, Carpenter Creek, and Oceano Lagoon. CRLF has been observed in Oceano Lagoon as recently as 2012 (Terra Verde Environmental Consulting 2012). In addition, in 2019, although it was not positively identified, a tadpole observed in Carpenter Creek is presumed to have been a CRLF given its characteristics. Activities at the campground have not been known to impact CRLF or their habitat to date. Pedestrian activities at the campgrounds are not expected to directly impact CRLF individuals, since park visitors, including campers, are prohibited from collecting animals and plants and damaging park resources. Moving vehicles in the campground could inadvertently strike a CRLF that has left the creek or lagoon and entered the campground; however, this has never been documented in the HCP area, and the likelihood of this happening in the future is low.

Indirect effects on CRLF from camping activities include an increase in trash, which could potentially boost predator populations (e.g., raccoons) and thereby incidentally increase predation on CRLF. To minimize this effect, CDPR will continue to inform all visitors that they must dispose of their trash in a trash dumpster, and CDPR will enforce rules to ensure the campsites are maintained in a clean condition. CDPR will also continue to maintain set trash service in the developed campgrounds to ensure that the trash receptacles are regularly emptied and do not overflow, attracting predators. As a result, this impact will continue to be minimal.

4.6.1.1.3 Pedestrian Activities (CA-3)

Most pedestrian-based activities are considered to have little, if any, effect on CRLF or its habitat since CRLF tend to be found in aquatic habitats less frequented by visitors. In addition, visitor activities do not result in loss of permanent loss of aquatic or upland habitat. As a result, it is unlikely that most pedestrian activities will directly affect CRLF in the future.

Pedestrians in suitable CRLF upland habitat are unlikely to encounter a CRLF and/or kill or injure a CRLF if it is encountered. Pedestrians that cross creeks or enter lagoons could stir up sediments and produce turbid stream flow in suitable aquatic CRLF habitat. CRLF occur in a wide range of turbidity conditions ranging from clear to highly turbid, but have been observed to be more common in relatively clear water (Bobzien and DiDonato 2007). Sediment and turbidity can affect CRLF by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by pedestrians crossing creeks or entering lagoons are largely considered to be temporary. CDPR will also continue to monitor popular creek crossings (e.g., Arroyo Grande Creek, Carpenter Creek and Pismo Creek) for CRLF. If CRLF are observed in or near creek crossings, CDPR will continue to post signs to close the crossings and encourage the use of other paths in the HCP area. As a result, this impact will continue to be minimal.

4.6.1.1.4 Dog Walking (CA-6)

Like pedestrians, dogs have not been documented impacting CRLF, but any impacts are difficult to observe and could occur without being observed. In general, dogs wading and swimming in estuaries or creeks occupied by CRLF can affect water quality by depositing waste, trampling vegetation, and temporarily increasing turbidity, thereby temporarily affecting habitat, foraging, ability to escape from predators, and reproductive success. However, dogs will continue to be required to be on a leash no

longer than 6 feet and remain under the control of an owner at all times, and mutt mitts will continue to be provided in the HCP area. As a result, impacts from dog walking are considered minimal and will be very minimal in the future.

4.6.1.1.5 Equestrian Recreation (CA-7)

Most equestrian-based activities occur in the northern portion of the HCP area and are considered to have little, if any, effect on CRLF or its habitat since CRLF tend to be found in habitats where equestrian activity does not occur and/or habitats that are less frequented by visitors. As a result, it is unlikely that equestrian activities will directly affect CRLF in the future.

If horses cross creeks or enter lagoons that are suitable habitat for CRLF, they could stir up sediments and produce turbid stream flow in aquatic CRLF habitat. CRLF occur in a wide range of turbidity conditions ranging from clear to highly turbid, but have been observed to be more common in relatively clear water (Bobzien and DiDonato 2007). Sediment and turbidity can affect CRLF by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by horses crossing creeks or entering lagoons are largely considered to be temporary. CDPR will also continue to monitor popular creek crossings (e.g., Arroyo Grande Creek, Carpenter Creek and Pismo Creek) for CRLF. If CRLF are observed in or near creek crossings, CDPR will continue to post signs closing the crossings and encourage the use of other paths in the HCP area. As a result, this impact will continue to be minimal.

4.6.1.1.6 Holidays (CA-10)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area on holidays. Therefore, no additional effect to CRLF occurs from motorized recreation on holidays.

Effects on holidays from non-motorized recreation are considered to be similar to those described for camping (section 4.6.1.1.2) and pedestrian activities (section 4.6.1.1.3). The increase in visitors on holidays can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on CRLF that have not previously been described.

4.6.1.1.7 Special Events (CA-11)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area during special events. Therefore, no additional effect to CRLF occurs from motorized recreation during special events. In addition, Special Event permits do not authorize activities to occur in areas that would otherwise be closed to visitors; therefore, no additional impacts from non-motorized and motorized activities occur in CRLF habitat that is typically off limits to visitors.

However, special events are potentially different from typical non-special event activities. First, many events tend to focus participants in the event area, which could mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Many special events occur during shoulder seasons and increase visitation at times when visitation would typically be lower. Effects on CRLF from concentrating spectators and vendors in an area are likely similar to the effects described for motorized recreation (section 4.6.1.1.1), camping (section 4.6.1.1.2), and/or pedestrian recreation (section 4.6.1.1.3). The increase in visitors during special events can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on CRLF that have not previously been described.

4.6.1.2 Natural Resources Management Program

4.6.1.2.1 Tidewater Goby and Salmonid Surveys (CA-13)

Occasionally, egg masses and CRLF individuals are present within tidewater goby and salmonid survey areas. If encountered unintentionally when seining or dipnetting in Arroyo Grande Creek or other aquatic habitats where CRLF may occur, CDPR biologists can affect all CRLF life stages (i.e., eggs, tadpoles, juveniles, and adults). However, fisheries biologists permitted to perform tidewater goby and salmonid surveys in CRLF habitat are required by the USFWS to conduct a visual survey for CRLF prior to sampling in areas where CRLF egg masses and individuals may be present. If egg masses or individuals are discovered, sampling for tidewater gobies will continue to be postponed until the eggs have hatched, or in a way that avoids all egg masses and individuals. As a result, impacts to CRLF during tidewater goby and salmonid surveys have not occurred in the past and are not expected in the future.

As part of the USFWS 10(a)(1)(A) Recovery Permit for tidewater goby, electrofishing is not allowed during tidewater goby surveys or within tidewater goby habitat; however, electrofishing is allowed in areas upstream of tidewater goby habitat under the terms of other scientific collecting permits and authorizations and is sometimes conducted for other fisheries surveys. Consequently, although unlikely, electrofishing activities could result in injury or mortality of CRLF tadpoles, juveniles, or adults. However, effects due to electrofishing are minimized by having a qualified biologist/Natural Resource staff conduct visual surveys as surveys are being conducted with appropriate avoidance measures if a CRLF is found in the survey area.

Fisheries surveys require biologists to stand in water and seine/dipnet or electrofish for fish. Surveys within aquatic habitats, including activities associated with salvaging stranded tidewater gobies, can indirectly affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment that is stirred up during seining, electrofishing, and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

CDPR biologists or their contractors can facilitate the introduction of amphibian chytridiomycosis during fisheries surveys. Amphibian chytridiomycosis is a disease caused by the zoospore fungus pathogen *Batrachochytrium dendrobatidis* (Bd), which can cause lethargy and weakness in adult frogs and usually results in death of tadpoles. Amphibian chytridiomycosis is transported in water or mud, including in muddy footwear. To minimize the potential to spread Bd, CDPR biologists will continue to use the Recommended Equipment Decontamination Procedures (USFWS 2005b, Cleveland 2018b). This includes disinfecting equipment and clothing after entering a pond/stream or before entering a new pond where CRLF may occur. Bd has not been found within the HCP area and the decontamination procedures will continue to minimize the threat. As a result, impacts associated with Bd are reduced or eliminated.

To reduce predation from invasive species, qualified biologists/Natural Resource staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrogs, largemouth bass, red-eared sliders, crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on CRLF.

4.6.1.2.2 Monitoring and Management for Listed Herpetological Resources (CA-14)

Most CRLF surveys result in minimal impacts to CRLF since most surveys for CRLF are eyeshine surveys conducted from the edge of the water bodies and/or kayak and only involve visually scanning for CRLF and/or egg masses. During these surveys, care is taken not to disturb sediments, vegetation, or any visible larvae. In addition, the surveys are conducted by a qualified biologist/Natural Resource staff. Therefore, impacts to CRLF will continue to be minimal during surveys. Visual encounter surveys for SWPT would have similar effects.

Dipnetting surveys are infrequently conducted in the HCP area. These surveys are conducted by CDPR biologists or their USFWS-approved contractors for purposes of monitoring, identification, and management of the species. CDPR biologists or their contractors could affect all life stages of CRLF (i.e., eggs, tadpoles, juveniles, and adults) when handling individuals and egg masses during CRLF dipnet surveys. During these surveys, CDPR biologists or their contractors could capture, injure, or kill a CRLF eggmass, tadpole, juvenile, or adult. Similarly, funnel traps for SWPT monitoring and pitfall traps for WSF could inadvertently trap juvenile or adult CRLF. To reduce impacts associated with these surveys when they do occur, they will continue to be conducted by an-approved biologist and will continue to be conducted in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF (USFWS 2005b) and other applicable survey guidance. As a result, although capture of adults/sub-adults/juveniles, tadpoles, or egg masses could occur, mortality and/or injury will continue to be minimized, if not eliminated. In addition, any capture of adults/sub-adults/juveniles, tadpoles, or egg masses is expected to continue to be low due to the distribution and relatively low number of CRLF that have been found in the HCP area during surveys to date (section 3.3.4.4).

Dipnet surveys involve biologists standing in water. Surveys within aquatic habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during wading and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

CDPR biologists or their contractors can facilitate the introduction of amphibian chytridiomycosis when entering the water for CRLF surveys. Amphibian chytridiomycosis is a disease caused by the zoospore fungus pathogen Bd, which can cause lethargy and weakness in adult frogs and usually results in death of tadpoles. Amphibian chytridiomycosis is transported in water or mud, including in muddy footwear. Therefore, CDPR biologists will use the Recommended Equipment Decontamination Procedures (USFWS 2005b) to minimize potentially spreading Bd. This includes disinfecting equipment and clothing after entering a pond/stream or before entering a new pond where CRLF may occur. Bd has not been found within the HCP area and the decontamination procedures will continue to minimize the threat. As a result, impacts associated with Bd are reduced or eliminated.

Ultimately, CRLF surveys and associated management benefit CRLF by providing information necessary to contribute to conservation of the species. Impacts to CRLF from monitoring or management of listed herpetological species will be covered under the USFWS Recovery Permit (TE-815-214-10).

4.6.1.2.3 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Only activities associated with marsh sandwort and/or Gambel's watercress are considered to have potential to impact CRLF. Listed plant monitoring, propagation, and habitat enhancement for marsh sandwort and Gambel's watercress in the HCP area to date are not known to have impacted CRLF. Monitoring of marsh sandwort and Gambel's watercress is not expected to impact CRLF since this occurs on foot by a trained botanist. Any future monitoring, propagation, and habitat enhancement activities for marsh sandwort and Gambel's watercress at Oso Flaco Lake has the potential to temporarily impact all life stages of CRLF (i.e., eggs, tadpoles, juveniles, and adults). Activities can result in injury or mortality if a CRLF is present within the work area. In addition, activities can disturb CRLF located near the work area and cause stress or cause them to move from cover where they may be exposed to predation.

To minimize impacts to CRLF associated with these activities, depending on the type of activities (e.g., ground disturbance), surveys for CRLF are conducted within 100 feet of any propagation and habitat enhancement activities in Oso Flaco Lake to ensure no CRLF are present. If a CRLF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual

or can proceed once they determine the activities can continue with minimal risk to the safety of the CRLF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, mortality, injury, and disturbance to CRLF will continue to be minimized.

Activities within aquatic habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

Ultimately, listed plant habitat enhancement at Oso Flaco Lake and in other aquatic habitat where CRLF may occur, benefits CRLF by reducing invasive plants in the area and improving habitat in the HCP area for CRLF.

4.6.1.2.4 Habitat Restoration Program (CA-16)

Habitat restoration conducted in the HCP area to date is not known to have impacted CRLF and is part of the management program offsetting the incidental take to CRLF from other covered activities; however, this management also has the potential to result in injury or mortality if a CRLF is present within the work disturbance area. Restoration can directly affect all CRLF life stages (i.e., eggs, tadpoles, juveniles, and adults), including by grading, ground disturbance with hand tools, vegetation removal and installation, and maintenance activities. In addition, activities can disturb CRLF located near the work area and cause them to move from cover where they may be exposed to predation. To minimize these possible impacts, depending on the type of activities (e.g., ground disturbance), surveys for CRLF will be conducted, as needed, to ensure no CRLF are present. If a CRLF is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or determines the activities can continue with minimal risk to the safety of the CRLF, which may include implementing additional AMMs such as exclusion fencing or biological monitoring. As a result, mortality, injury, and disturbance to CRLF will be minimized.

4.6.1.2.5 Invasive Plant and Animal Control (CA-17)

Invasive plant or animal control activities conducted in the HCP area to date are not known to have impacted CRLF. CDPR biologists can directly affect all life stages of CRLF (i.e., eggs, tadpoles, juveniles, and adults) by disturbing occupied habitat during standard invasive animal and plant control efforts. Invasive pest plant and animal control activities may require qualified biologists/Natural Resource staff or CDPR approved contractors to remove pest plants and animals in suitable CRLF aquatic or upland habitat, including moist vegetated areas that CRLF can use for dispersal. Activities like bullfrog removal can involve staff working in or adjacent to aquatic habitat which could involve the risk of crushing adults and juveniles, dislodging egg masses, stirring up sediment, or crushing burrows. However, pre-activity surveys will continue to be conducted, at the discretion of a CDPR biologist, prior to commencing any activities that can disturb suitable CRLF aquatic or upland habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the CRLF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from invasive plant and animal control will be minimal.

Activities within aquatic habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

Invasive animal control may include activities like bullfrog removal or trapping red-eared sliders and crayfish. These activities may involve installing funnel traps, direct targeting of individuals, and other work in aquatic habitats that could result in injury or death of CRLF. Funnel traps could inadvertently trap a CRLF. Direct targeting of bullfrog could also injure or harm CRLF. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to CRLF from other covered activities; however, this management also has the potential to cause harm to CRLF. To reduce impacts associated with invasive animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for CRLF. Any take from these focused predator control activities will be described in this HCP and not through a USFWS Recovery Permit.

Ultimately, invasive-pest plant and animal control in aquatic and/or upland habitat where CRLF may occur benefits them by reducing invasive species in the HCP area and improving their habitat. This activity more than offsets the impacts to the species by removing vegetation and/or animals that pose a threat to CRLF individuals or its habitat.

4.6.1.2.6 Water Quality Monitoring Projects (CA-19)

Water quality monitoring in the HCP area to date is not known to have impacted CRLF. Installation of water quality monitoring equipment can temporarily affect CRLF by disturbing individuals as workers enter occupied aquatic habitat. However, pre-activity surveys will continue to be conducted prior to commencing any activities disturbing suitable CRLF aquatic habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the CRLF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from water quality monitoring will continue to be minimal.

Maintenance of water quality monitoring equipment within aquatic habitats can affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment, and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

Future projects for water quality monitoring are not known at this time. Any future projects will be evaluated for consistency with this HCP and may be permitted under a separate regulatory process, if necessary. Improvements to water quality that result from ongoing water quality monitoring and improvement projects in occupied habitat will ultimately benefit CRLF by creating more suitable habitat within the HCP area.

4.6.1.3 Park Maintenance

4.6.1.3.1 Campground Maintenance (CA-20)

The two designated campgrounds within the HCP area are adjacent to Meadow Creek, Carpenter Creek, and Oceano Lagoon. CRLF have been observed in Oceano Lagoon as recently as 2012 (Terra Verde Environmental Consulting 2012, K. Drexhage, pers. comm. 2016). In addition, in 2019, although it was not positively identified, a CRLF tadpole was potentially observed in Carpenter Creek. Maintenance vehicles at the campground can inadvertently strike a CRLF that has left the creek or lagoon and entered the campground area; however, this has never been reported in the HCP area to date. Any CRLF dispersing through the campground area is expected to occur during the night or under wet conditions; therefore, ground-disturbing maintenance activities will continue to be avoided during heavy precipitation (i.e., at least 0.5-inch of precipitation in a 24-hour period). Maintenance activities that continue in all weather will continue to be limited to housekeeping-type routine maintenance activities

such as repairs to hose bibs and changing light bulbs that are not expected to impact CRLF. In addition, depending on the activities (e.g., ground disturbance, work directly adjacent to aquatic habitat), pre-activity surveys will continue to be conducted prior to campground maintenance activities. If a CRLF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the CRLF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. Lastly, all maintenance personnel will continue to receive annual training that will cover CRLF life history and work constraints. As a result, impacts from campground maintenance activities will continue to be minimal.

4.6.1.3.2 General Facilities Maintenance (CA-21)

CDPR maintains facilities and infrastructure that support public activities throughout the HCP area. These maintenance areas include sites like the levee and trail from Grand Avenue to Pismo Beach, underground infrastructure to support the corporation yard and developed campgrounds, fences around areas like the corporation yard, and a network of formal trails around Oceano Lagoon and the Grand Dunes. Maintenance of these facilities could include minor grading, routine vegetation control, pedestrian bridge maintenance, and other projects that could occur in or near CRLF breeding or adjacent dispersal habitat. This work will be infrequent, and standard AMMs will be followed including pre-project surveys as needed, timing projects to avoid critical life stages, and relocation of individuals if found in work areas. Given that these activities generally will not occur at night when most dispersal occurs, they are not unlikely to impact CRLF.

Mechanical trash removal is a new proposed activity. It will not occur in aquatic habitat areas or in vegetated dunes. Therefore, CRLF in aquatic or vegetated habitat will not be impacted.

CRLF may disperse through upland habitat in the geographic areas proposed for mechanical trash removal north of Post 6. Mechanical trash removal could kill or injure a CRLF if it dispersed through the area while mechanical raking was occurring. However, CRLF rarely disperse through open, barren sand areas where mechanical trash removal will occur. In addition, mechanical trash removal will not occur at night when most dispersal occurs. As a result, mechanical trash removal will be unlikely to impact CRLF.

4.6.1.3.3 Routine Riparian Maintenance (CA-26)

Riparian maintenance activities are not known to have impacted CRLF in the past. Riparian maintenance activities that can affect CRLF include the clearing of debris, vegetation, and sediment from culverts and spillways; riparian tree and shrub vegetation control (e.g., removing or trimming vegetation); and emergent and invasive species control. CRLF may occur in riparian areas where maintenance activities are located. If CRLF egg masses, tadpoles, juveniles, or adults are present in the riparian maintenance area they can be directly affected by disturbance to habitat. Individuals may be disturbed by or caught in rakes or other hand equipment used to remove sediment, debris, or vegetation. Any egg masses or larvae can also be disturbed or crushed by workers or equipment during culvert and spillway maintenance and the removal of emergent vegetation. However, culvert maintenance will continue to be conducted during periods when egg masses or larvae are unlikely to occur in the area (e.g., low flow period), to the extent feasible. In addition, a qualified biologist/Natural Resource staff will conduct a survey of the work area for CRLF within 48 hours prior to any riparian maintenance activities. If CRLF adults, tadpoles, or egg masses are observed, work will not commence until AMMs are in place. Furthermore, a qualified biologist/Natural Resource staff will continue to be present, as necessary, during maintenance activities to ensure CRLF are not present while work is occurring, and any herbicides used will be labeled for aquatic use. As a result, direct impacts to CRLF from riparian maintenance are not expected in the future.

Riparian maintenance activities can temporarily result in an increase in turbidity because the in-stream vegetation traps and holds sediments. Temporarily suspended sediment can affect CRLF. However, sediment stirred up during activities will continue to be minimal, localized, and temporary. In addition, heavy equipment will not be placed in the water, and backhoe work will continue to be restricted to the roadside or upper bank with only the bucket placed in the water body. Therefore, impacts associated with suspended sediments will continue to be minimized and will not affect CRLF habitat in the long-term.

Riparian maintenance activities can indirectly attract CRLF predators into potential CRLF habitat areas. For example, temporary disturbance of stream channel soils during culvert maintenance or removal of emergent vegetation can create areas of ponded water that support bullfrogs and invasive crayfish, both of which prey upon CRLF. To minimize these effects, project areas are left in a condition that mimics natural conditions and will not attract predators to the site. In addition, any non-native CRLF predators encountered (e.g., bullfrogs and invasive crayfish) will be removed by a qualified biologist/Natural Resource staff. Trash will also continue to be removed from the work area on a daily basis during all maintenance activities to minimize attracting potential predators (e.g., raccoons) to the work area.

CDPR biologists can facilitate the introduction of Bd, which is transported in water or mud, including in muddy footwear. Therefore, CDPR biologists will continue to use the Recommended Equipment Decontamination Procedures (USFWS 2005b) to minimize potentially spreading Bd. This includes disinfecting equipment and clothing after entering a pond/stream or before entering a water body where CRLF may occur. Bd has not been found within the HCP area, and the decontamination procedures will continue to minimize the threat. As a result, impacts from Bd are not expected.

Riparian maintenance activities can affect an annual maximum of approximately 0.3 acre of wetlands for culvert cleanout, debris removal, and emergent vegetation removal. In addition, approximately 2 miles of riparian corridor segments will continue to be subject to tree maintenance and invasive weed control as the need arises. Maintenance of these areas will continue to reoccur over the course of the permit, as needed, when vegetation regrows. These activities can reduce aquatic and/or riparian habitat available for CRLF. However, these impacts will continue to be minor and temporary.

4.6.1.3.4 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Maintenance of trail and access corridors, including boardwalks, paths, and sand ramps, is completed on an as-needed basis. The frequency of this work mainly depends on visitor use and/or any weather-related damage. Vegetation intruding onto any footpaths may need to be trimmed at least once a year and is usually completed using hand tools. Vegetation trimming does not involve plant removal or disturbance of soil or aquatic habitat where CRLF may occur; thus, vegetation trimming is unlikely to affect CRLF habitat or individuals. Any effects on CRLF aquatic habitat during boardwalk maintenance will continue to be minor and temporary, and potential for direct impacts to individuals will continue to be very low.

4.6.1.4 Visitor Services

4.6.1.4.1 Emergency Response (CA-33)

It is necessary from time to time for law enforcement and/or medical aid to respond to an emergency that is located off a designated trail. When this occurs, there can be some trampling of vegetation near an aquatic resource or a creek might be crossed without the use of a bridge or hardened bottom. These activities can result in damage to CRLF habitat. This damage is difficult to document; however, damage to habitat is considered to be minor and temporary.

Emergency vehicle direct impacts to CRLF are difficult if not impossible to document since emergency response must be implemented immediately and quickly. It is possible, but highly unlikely, that eggs, tadpoles, juveniles, or adults can be directly affected by such an incident by being struck/crushed by a vehicle. This will especially be true for vehicles that need to drive above the 15-mph speed limit to respond to an emergency.

Emergency response activities that cross creeks can temporarily stir up sediment and increase turbidity. Sediment stirred up during activities is localized and temporary (lasting only during the emergency action) and therefore will not affect CRLF habitat in the long term.

4.6.1.4.2 Access by Non-CDPR Vehicles (CA-34)

Non-emergency non-CDPR vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline, following all applicable speed limits. Such vehicles do not enter the Exclosures or Oso Flaco area where vehicles are prohibited. Given the focused purpose such staff have when entering the HCP area, Impacts from their vehicles are likely less than those of motorized recreation. Effects from emergencies associated with non-CDPR vehicles, however, are similar to those effects described for CA-33, and CDPR is not always able to train non-CDPR responders. Therefore, given the travel speeds sometimes necessary for emergency response, some vehicle strikes or other harm may not be avoided.

4.6.1.4.3 Pismo State Beach Golf Course Operations (CA-37)

CRLF has been observed in Arroyo Grande Creek and Oceano Lagoon (Terra Verde Environmental Consulting 2012, Cleveland 2023, K. Drexhage, pers. comm. 2016) and thus has a low to moderate potential to occur in nearby Meadow Creek and Carpenter Creek[76], both of which are adjacent to Pismo State Beach Golf Course. CRLF may disperse to Meadow Creek, Carpenter Creek, and/or the golf course ponds, especially during wet weather, and one CRLF was observed in a golf course pond in June 2024. If CRLF disperse through the golf course to reach these locations, golf course operations and maintenance activities, such as golf cart traffic and mowers, can potentially strike CRLF individuals and injure or kill them. The potential for such incidents is low because most adult CRLF movement is during the night when no golfing activity will occur.

Maintenance activities, including mowing, are unlikely to affect CRLF because maintenance activities occur during the day when CRLF movement is less likely to occur and grass height at the golf course does not provide adequate cover for frogs. To further minimize effects from golf operations maintenance, ground-disturbing maintenance activities will continue to be delayed during heavy precipitation (i.e., at least 0.5-inches of precipitation in a 24-hour period).

Maintenance of water features in the golf course can potentially disturb all life stages (i.e., eggs, tadpoles, juveniles, adults) of CRLF during emergent vegetation trimming and removal or repair of bridges. However, most vegetation trimming is conducted by hand. In addition, if determined to be necessary by a qualified biologist/Natural Resource staff (e.g., there is previous evidence of CRLF activity from surveys), pre-activity surveys will continue to be conducted prior to commencing any activities that may disturb suitable CRLF aquatic habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the CRLF, which may include implementing AMMs. In addition to relocation, AMMs

[76] In 2019, although it was positively identified, a CRLF tadpole was potentially observed in Carpenter Creek.

may include exclusion fencing, biological monitoring, or other measures. As a result, direct impacts from aquatic maintenance activities will continue to be reduced or eliminated.

Activities within the golf course ponds can affect CRLF by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during activities is localized and temporary and will not affect CRLF habitat in the long term.

4.6.1.4.4 Grover Beach Lodge and Conference Center (CA-38)

According to the Grover Beach Conference Center Biological Assessment (Althouse and Meade, Inc. 2005, amended 2009) and the Revised Final Environmental Impact Report (SWCA Environmental Consultants 2012), construction of the Grover Beach Lodge is not anticipated to affect CRLF. The Final EIR for the Grover Beach Lodge construction project states that the project will avoid direct impacts to the aquatic portions and riparian vegetation of Meadow Creek and will ultimately likely improve water quality in the creek by enhancing runoff filtration capabilities on the site. As a result, no direct impacts to CRLF are expected from the Grover Beach Lodge, and CRLF are expected to benefit from water quality improvements in the creek.

4.6.1.5 Other HCP Covered Activities

4.6.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Carpenter Creek is suitable habitat for CRLF and in 2019, although it was not positively identified, a CRLF tadpole was potentially observed within this creek. As a result, CRLF could occur in Carpenter Creek and might be affected by motorized vehicles crossing the creek. CRLF can be inadvertently struck by a vehicle crossing the creek; however, vehicle operators will continue to be encouraged to cross in areas with low or no flow, and all vehicles will continue to be required to travel at a speed of 15 mph or less. Therefore, effects on CRLF from vehicles crossing Carpenter Creek are anticipated to be minimal in the future even if a CRLF is observed in the creek.

Vehicles crossing aquatic CRLF habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during vehicle crossings will be localized and temporary and will not affect CRLF habitat in the long-term.

CRLF have not been observed and are not expected to occur in Arroyo Grande or Oso Flaco Creek where vehicles cross since vehicles cross the creeks near the shoreline where the water salinity is too high for CRLF to persist. Although it is unlikely, it is possible that CRLF could be washed out of inhabited areas along with storm debris and end up on the beach and near creek crossing locations in the future. As a result, although no effects from vehicle crossings are considered to have occurred in these areas, and none are anticipated at these locations in the future, the slight possibility exists for future impact.

4.6.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

The Pismo Creek Estuary seasonal floating bridge has not been installed at this time. The floating bridge at Pismo Creek Lagoon has a small potential to impact CRLF, particularly at the northern access point. However, to date, CRLF are only known from areas farther upstream of the CDPR-owned portions of Pismo Creek. Furthermore, the Pismo Creek Lagoon is considered low quality suitable habitat for CRLF due to the intrusion of saltwater. Therefore, there is low potential for CRLF to be present in the area where the floating bridge would be installed. As a result, impacts associated with the floating bridge will be unlikely.

Construction activities within Pismo Creek could affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution will be taken not to stir up sediment and any sediment stirred up

during activities will be minimal, localized, and temporary and will not affect CRLF habitat upstream of the project area.

4.6.1.5.3 Dust Control Activities (CA-44)

Some dust control activities are currently occurring in the HCP area, and additional dust control activities are being proposed as future activities. Future dust control activities will not occur in CRLF aquatic habitat.

Future dust control activities could include planting vegetation in upland habitat for CRLF. Additional upland habitat will continue to be affected by air quality monitoring equipment installation. This habitat will vary in its suitability for CRLF dispersal since it could occur within upland habitat anywhere within the foredunes and/or backdunes. Impacts to CRLF were not observed during previous dust control activities. It is unlikely, but possible, that CRLF will disperse through or be found in areas prior to vegetation or monitoring equipment being installed. Individuals in a dust control work area could be injured or crushed. However, the numbers and distribution of CRLF found in the HCP area have been relatively limited, and additional dispersal habitat will continue to be available in the HCP area outside the dust control areas. CDPR will implement AMMs for CRLF, as appropriate, including conducting pre-activity surveys as necessary and delaying activities until the individual moves from the work area or appropriate AMMs are in place (e.g., relocation, exclusion fencing, biological monitoring). As a result, impacts to aestivating or dispersing CRLF are expected to be minimal. In addition, vegetation planted for dust control activities provides necessary cover for CRLF if they are dispersing through the area and would benefit CRLF.

4.6.1.5.4 Cultural Resources Management (CA-45)

To date, cultural resource management has not resulted in impacts to CRLF. If a new cultural site is found, impacts from cultural resource management would be similar to those described for general facilities maintenance (section 4.6.1.3.2), and AMMs are expected to avoid incidental take.

4.6.1.5.5 CDPR Management of Agricultural Lands (CA-46)

Two ditches associated with agricultural lands contain runoff from the agricultural lands and flow to Oso Flaco Lake. CRLF have not been found within the agricultural ditches; however, CRLF adults could be present in these areas in the future and activities could disturb or injure/kill an individual (e.g., when equipment is used to remove sediment, debris, or vegetation). CDPR will continue to implement AMMs, including conducting activities during low flow periods (if feasible), having a qualified biologist/Natural Resource staff conduct a focused survey of the work area (subject to their discretion), and having them present (if necessary), to reduce the potential to disturb, injure, or kill CRLF. As a result, this impact will continue to be minimal.

4.6.1.5.6 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

Although the bioreactor requires little to no maintenance, given its location in aquatic habitat near known CRLF occurrences, a CRLF could be harmed during bioreactor maintenance activities.

4.6.1.5.7 Oso Flaco Lake Boardwalk Replacement (CA-48)

The Oso Flaco Lake boardwalk may eventually need to be replaced with a comparable boardwalk in roughly the same location. Most of the boardwalk is within upland habitat, but approximately 1,000 feet of the existing Oso Flaco Lake boardwalk occurs within aquatic habitat. The boardwalk also includes two resting areas/viewing platforms within aquatic habitat. The layout and/or location of the new boardwalk might need to shift slightly to accommodate conditions at the time of replacement such as changes in codes or other operational or design considerations. Thus, although it is anticipated the replacement

boardwalk will be located in roughly the same location, the HCP includes the loss of up to 1.5 acres of CRLF habitat. Depending on the type of repair, existing piles may need to be removed and new piles may be installed. Replacing the entire boardwalk will cause temporary disturbance of CRLF aquatic habitat including substantial, but temporary, turbidity and could include pile driving and a boat or floating platform to ferry supplies; however, pre-activity surveys by a qualified biologist/Natural Resource staff will be conducted prior to commencing any activities disturbing suitable CRLF habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the CRLF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from Oso Flaco Lake boardwalk replacement will be minimized.

As noted, this activity has the potential to stir up sediment and cause turbidity in the lake. It is not known how much turbidity could impact resident CRLF. A project of this scale will trigger various permits from regulatory agencies including the U.S. Army Corps of Engineers and the Regional Water Quality Control Board. CDPR will follow the requirements of those permits and implement any best management practices needed to reduce the impacts from sediment from pile removal and replacement on aquatic organisms in Oso Flaco Lake, including CRLF.

4.6.1.5.8 Special Projects (CA-49)

Specific special projects or project designs are not known at this time. Any special projects, such as the replacement or expansion of existing facilities or the construction of new facilities will directly affect CRLF habitat if the special project occurs within CRLF habitat. Effects of special projects in CRLF upland habitat, such as installing a new vault toilet, will be similar to those discussed in dust control activities (section 4.6.1.5.3). No special projects will occur in aquatic habitat or near enough to aquatic habitat to have an effect on CRLF or suitable aquatic habitat.

4.6.1.5.9 Use of Pesticides (CA-51)

Pesticides are currently used in the HCP area in upland and near aquatic habitat; however, the effects of pesticides on CRLF are not well documented. As a result, this section discusses potential effects that could occur to CRLF.

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, there is potential for indirect effects in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species; moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general; rather, any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Very few pesticides are tested for toxic effects to amphibians. Most studies look at mammals, birds, fish, and insects. In the absence of robust toxicity data for amphibians in aquatic habitats, the EPA uses fish toxicity as a surrogate. For example, in a 2008 study, EPA compiled toxicity studies for technical glyphosate (formulated without a surfactant) on species deemed suitable to act as CRLF surrogates. Results ranged from practically non-toxic to slightly toxic with the lowest (i.e., most conservative) acute toxicity LC50 value (i.e., the lethal concentration of a chemical causing 50 percent mortality of test animals) of 43 milligrams active ingredient per liter (mg/L), and the lowest no-observed-adverse-effect level of 30.6 mg/L (EPA 2008).

A description of the location where each pesticide is used in the HCP area in relation to CRLF habitat and the anticipated effects of each pesticide on CRLF follows.

Glyphosate is proposed to be used in upland habitats and aquatic formulations of Glyphosate (Rodeo® and Aquamaster®) are proposed to be used in aquatic habitats within the HCP area for control of invasive plants, including within CRLF breeding and dispersal habitat. As stated above, glyphosate is not expected to be toxic to CRLF in aquatic habitats. Glyphosate toxicity data for amphibians that inhabit terrestrial environments is also lacking. EPA uses toxicity data from avian receptors as a surrogate for CRLF in terrestrial environments (EPA 2008). These studies showed that glyphosate is slightly toxic to the selected avian species, with the lowest LD50 value (i.e., dose required to kill 50 percent of a population of test animals) reported as ingestion of greater than 3,196 mg of active ingredient per kilogram of body weight (EPA 2008); however, no mortalities occurred in any of the studies, so this number is likely to be strongly conservative. EPA completed a biological evaluation for glyphosate and determined glyphosate is likely to adversely affect CRLF (EPA 2021a). Future consultation between EPA and USFWS may result in additional mitigation measures for glyphosate use (EPA 2021b), which may or may not be applicable to the HCP area.

Fluazifop-P-butyl has been rated as highly toxic to aquatic and terrestrial amphibians (White 2007). However, CDPR does not use Fluazifop-P-butyl near aquatic systems in the HCP area; it is only used for spot treatment in terrestrial habitats when Russian wheatgrass, veldt grass, and European beach grass are intermixed with native plants. In addition, contractors only apply Fluazifop-P-butyl when wind speeds are low (less than 10 mph) and rain is not predicted in the next 48 hours. As a result, effects from Fluazifop-P-butyl on CRLF are not expected.

The aquatic formulation of imazapyr (Habitat®) is proposed to be used adjacent to aquatic habitats, including CRLF breeding habitat, in the HCP area to control invasive plants once an APAP is issued. The EPA's 2007 risk assessment indicates that no direct effects are expected on either the aquatic or terrestrial phase of CRLF from imazapyr (EPA 2007). There are also no indirect effects expected for CRLF through direct effects to either its terrestrial or aquatic food sources. The effects determination for direct effects on CRLF and for indirect effects through food sources is "no effect." Some indirect effects to CRLF may occur due to direct effects on habitat and/or primary productivity (i.e., ecosystem structure and function for both the aquatic plant community and riparian vegetation).

Triclopyr is used to treat Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. Given that no scientifically valid triclopyr toxicity data are available for aquatic-phase amphibians, freshwater fish data were used as a surrogate to estimate direct acute and chronic risks to CRLF. Freshwater fish toxicity data were also used to assess potential indirect effects of triclopyr to CRLF. The EPA's 2009 risk assessment on triclopyr indicates that no direct effects are expected on either the aquatic or terrestrial phase of CRLF from triclopyr (EPA 2009). Effects on freshwater fish resulting from exposure to triclopyr indicate CRLF may be indirectly affected via reduction in available food.

Aminocyclopyrachlor is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. The EPA (2010) classifies aminocyclopyrachlor as practically non-toxic or only slightly toxic to mammals, birds, fish, and aquatic invertebrates (SERA 2012). There is no information regarding the toxicity of aminocyclopyrachlor to aquatic-phase amphibians. In view of this lack of data, the EPA follows a standard approach in that freshwater fish (i.e., rainbow trout and bluegill sunfish) are used as surrogates for aquatic phase amphibians. No toxicity data are available for terrestrial-phase amphibians, so no dose-response can be derived (SERA 2012).

Chlorsulfuron is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. No ecotoxicity studies have been conducted for the effects of Chlorsulfuron on amphibians, but it has been found not to pose a risk to fish or aquatic invertebrates from direct spray, off-site drift, or surface runoff (ENSR International 2005). It has been found to have a very low potential to cause adverse effects in aquatic animals (SERA 2004) and has been rated as practically non-toxic to aquatic amphibians (White 2007).

Aminopyralid is used to control Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. Only one study on the effects of Aminopyralid on amphibians has been conducted, which indicated that leopard frog larvae are no more sensitive to aminopyralid than fish (SERA 2007). Aminopyralid has been shown to be practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates. There are no acute or chronic risks to non-target endangered or non-endangered fish, birds, wild mammals, terrestrial and aquatic invertebrates, algae, or aquatic plants (EPA 2005).

Sethoxydim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, CRLF in aquatic habitat are not impacted. Neither the published literature nor the EPA files include data regarding the toxicity of sethoxydim to amphibian species. Sethoxydim is moderately to slightly toxic to fish (SERA 2001). The acute static LC50 values for technical grade sethoxydim range from 170 to 265 parts per million (mg/L) in bluegill sunfish and rainbow trout, respectively (BASF 1982 as cited in (SERA 2001)). The formulated product, Poast®, however, is much more toxic with LC50 values of 2.6 ppm in bluegill sunfish and 1.2 ppm in rainbow trout (Bowman and Howell 1991 as cited in (SERA 2001)). The higher toxicity in Poast® is likely attributable to the presence of naphtha solvent. However, CRLF in upland habitat are unlikely to be impacted since they only occur in upland habitat during dispersal events. In addition, CRLF typically disperse at night, and herbicides are only applied during the day.

Clethodim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, CRLF in aquatic habitat are not impacted. There is no information regarding the toxicity of clethodim to reptiles or terrestrial-phase amphibians in the open literature or in the available EPA studies (SERA 2014). In the absence of information on terrestrial-phase amphibians, the EPA uses birds as a surrogate. Clethodim is practically non-toxic to birds.

VectoBac G is applied by helicopter over large areas in the HCP area, which could include occupied CRLF aquatic and upland habitat. VectoBac G is toxic only to the larvae of certain diptera. It does not directly or indirectly harm other aquatic, marine, or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® or Renegade EA® on CRLF. The product safety data sheets state that these products have not been classified as environmentally hazardous (Wilbur-Ellis 2016a, 2016b). However, one study found that glyphosate-surfactant mixtures, such as Competitor®, were more toxic to western toad than glyphosate alone (Vincent and Davidson 2015). CDPR will use only herbicides that are approved for aquatic use in aquatic habitats, including CRLF breeding habitat.

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area is expected to benefit CRLF by preventing invasive

plants from taking over CRLF habitat or providing hiding places for predators. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to covered species are expected to decrease with increasing distance away from the treated field or site of application. CDPR takes extra precautions when applying pesticides near open water and wetlands and other sensitive habitats that support covered species. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Table 5-5 are considered to reduce or eliminate these impacts.

4.6.2 Anticipated Take of California Red-Legged Frog

This section quantifies the potential for incidental take of CRLF due to the effects described in the preceding sections. Although many of these covered activities are currently occurring in the HCP area, very little is known about the actual impacts on CRLF since CRLF take associated with park visitor activities has not been observed. The number of CRLF that may be killed or injured because of covered activities is difficult to quantify for the following reasons: 1) the number and location of CRLF within a population vary from year to year; and 2) the aquatic nature of CRLF, and the relatively small body size of CRLF, particularly tadpoles and egg masses, makes finding a dead or injured CRLF of any life stage unlikely. Therefore, this HCP attempts to quantify take levels (i.e., harm, pursue, wound, kill, trap, capture or collect, or to attempt to engage in these activities) in the HCP area that could occur and go undetected, especially given the low abundance of CRLF in the HCP area and the difficulty in finding them.

Table 4-8 presents threshold levels of CRLF adults/sub-adults, tadpoles, and egg masses that may be detected as killed or injured over the permit term due to covered activities (referred to as "non-recovery" activities/actions) not specific to recovery activities authorized under Recovery Permit TE-815214-10. These threshold levels represent limits for take from covered activities. The HCP also recognizes that for every CRLF found dead or injured, other individuals may be killed or injured that are not detected. As a result, the estimation of take is considered a worst-case scenario and is not expected to occur in most years, if at all.

CDPR has no records of CRLF take in the HCP area to date. Take may occur as a result of covered activities in suitable CRLF upland habitat and during covered activities within suitable CRLF aquatic habitat (Map 28). Although AMMs will be implemented to minimize take, a small amount of take may occur incidental to these activities. In addition, CRLF will be captured and relocated during dipnet surveys, if conducted, and a subset of these captured individuals could be killed or injured due to mishandling or stress.

CRLF have been observed in Arroyo Grande Creek and Estuary, Little Oso Flaco Lake, Oso Flaco Lake, Pismo State Beach Golf Course, Meadow Creek, Carpenter Creek, and Oceano Lagoon. They may inhabit additional aquatic areas subject to park visitor activities, park maintenance, visitor services, and other HCP covered activities. Specific existing and/or new park visitor activities, park maintenance, visitor services, and other HCP covered activities that could affect CRLF include the following:

- Motorized activities (CA-1)
- Camping (CA-2)
- Pedestrian activities (CA-3)
- Dog Walking (CA-6)
- Equestrian recreation (CA-7)
- Holidays (CA-10)

- Special events (CA-11)
- Habitat restoration program (CA-16)
- Invasive plant and animal control (CA-17)
- Routine riparian maintenance (CA-26)
- Emergency response (CA-33)
- Access by Non-CDPR Vehicles (CA-34)
- Pismo State Beach Golf Course operations (CA-37)
- Motorized crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
- Pismo Creek estuary seasonal (floating) bridge (CA-41)
- Cultural resource management (CA-45)
- CDPR management of agricultural lands (i.e., drainage ditch maintenance) (CA-46)
- Maintenance of a Bioreactor on Agricultural Lands (CA-47)
- Oso Flaco Lake boardwalk replacement (CA-48)
- Use of pesticides (CA-51)

Additionally, up to 1.5 acres of CRLF aquatic habitat could be permanently affected by the replacement of the Oso Flaco boardwalk and viewing platform at Oso Flaco Lake (Table 4-9). Up to 35 acres of upland habitat could be affected by special projects, and some additional areas could be closed for dust control planting. All such vegetation ultimately benefits CRLF as it converts open sand to a more hospitable vegetated habitat and is not considered habitat loss. Up to 3 acres may be modified at any given time for temporary air quality monitoring equipment A maximum of 1.0 acre of wetland and open water habitat will continue to be temporarily impacted each year by routine riparian maintenance, Pismo State Beach Golf Course maintenance, and/or CDPR management of agricultural lands drainage ditch maintenance. Additionally, a maximum of 2.0 acres of riparian corridor segments will be subject to temporary spot treatments for continued tree maintenance and invasive weed control as the need arises during the life of the HCP. This short-term disruption of habitat will not result in a permanent reduction of habitat but may increase disturbance and/or the potential for mortality of CRLF that could inhabit the disturbed area.

In addition to CRLF habitat loss, this HCP proposes take coverage in aquatic and upland habitats for CRLF adults/sub-adults/juveniles, tadpoles, and egg masses. Only adults/sub-adults/juveniles will be affected by covered activities in upland habitat since tadpoles and egg masses only occur in aquatic habitat. Park visitor activities, including motorized recreation, and management activities that occur at the Pismo State Beach Golf Course, North Beach Campground, and Oceano Campground may result in mortality or injury of CRLF adults/sub-adults/juveniles dispersing through upland habitat.

CRLF has a low to moderate potential to occur in Meadow Creek and Carpenter Creek[77] adjacent to Pismo State Beach Golf Course and has been observed in a golf course pond. CRLF could disperse to Meadow Creek, Carpenter Creek, and/or the golf course ponds and could be crushed or injured by golf

[77] In 2019, although it was not positively identified, a CRLF tadpole was thought to be observed in Carpenter Creek.

course management, such as mowing. AMMs, including environmental awareness training for golf course maintenance staff, will continue to reduce the potential for CRLF incidental take.

Additionally, CRLF could occur in Meadow Creek and Carpenter Creek adjacent to North Beach and Oceano Campgrounds. CRLF is not currently known to occur in Meadow Creek and may have been observed in Carpenter Creek. CRLF could be present in either creek due to the proximity of known populations at nearby Arroyo Grande Creek and Estuary and Oceano Lagoon. CRLF present in these areas could disperse to Meadow Creek and Carpenter Creek and could be crushed or injured by maintenance activities (e.g., mowing) and/or park visitor vehicles could crush or injure CRLF in the campground area.

In the past 20 years, CRLF has been observed once in dunes at nearby Guadalupe-Nipomo Dunes National Wildlife Refuge (Cleveland 2014). Consequently, there is a small potential for CRLF to attempt to disperse through the open riding area. However, CRLF tends to disperse at night during periods of wet weather when levels of motorized vehicle recreation are low; therefore, take in the open riding area is expected to be low.

CRLF are likely to inhabit aquatic areas subject to measures intended to benefit CRLF and other covered species, including invasive pest plant and animal control (CA-17). While most of the natural resource management activities that could affect CRLF will be authorized by USFWS Recovery Permit TE-815214-10 as outlined in Appendix C, there is the potential for incidental take of CRLF from listed plant management, habitat restoration, invasive plant and animal control activities, and water quality monitoring.

Listed plant monitoring, propagation, and habitat enhancement and water quality monitoring may involve working in the water or on adjacent banks and upland habitat with the potential for impacting eggs or individuals and sediment impacts. These activities will be conducted in coordination with qualified biologists/Natural Resource staff to ensure AMM implementation. Invasive plant and animal control may disturb occupied habitat and include activities like bullfrog removal or the trapping of red-eared sliders and crayfish. These activities may involve installing funnel traps, direct targeting of individuals, and other work in aquatic habitats which could result in injury or death of CRLF. Funnel traps could inadvertently trap a CRLF. Direct targeting of bullfrog could also injure or harm CRLF. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to CRLF from other covered activities; however, this management also has the potential to cause harm to CRLF. To reduce impacts associated with invasive animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for CRLF. Any take from these activities will be covered as described in this HCP and not through a USFWS Recovery Permit.

As stated previously, CDPR has no records of CRLF take in the HCP area to-date, and take of CRLF in the HCP area is difficult to quantify due to the small number of CRLF present in the HCP area and due to the small size of individuals. Between 2010 and 2023, over 150[78] observations of CRLF adults/juveniles have been recorded in or within close proximity to the HCP area, with the highest number (i.e., 52) of CRLF

[78] Because multiple surveys were conducted, the same individual may have been observed and counted during more than one survey.

adults/juveniles observed in 2020. In 2019, up to four[79] CRLF tadpoles were also observed in the HCP area. In addition, in 2019, one CRLF egg mass was observed.

Only a small portion of CRLF in the HCP area are anticipated to be injured or killed due to covered activities. However, this HCP provides a worst-case estimate of take to account for individuals that may not have been observed injured or dead in the past. Therefore, this HCP estimates that a maximum of five adults/sub-adults/juveniles, five tadpoles, and two egg masses could be crushed, injured, or killed in a year due to covered activities. Actual take is expected to be substantially lower in most years given the marginal quality of many aquatic and upland habitats within the HCP area, the few documented sightings of CRLF within the HCP area, and the AMMs that will be implemented. Because CRLF are not likely to be injured or killed each year, this HCP provides an estimate of CRLF that could be crushed, injured, or killed over the permit term. As a result, this HCP estimates that a maximum of 30 CRLF adults/sub-adults/juveniles, 40 tadpoles, and 25 egg masses could be injured or killed due to covered activities over the permit term. Additionally, over the term of the HCP, CDPR anticipates handling up to 300 individuals (adults/sub-adults/juveniles) to relocate them out of harm's way and into suitable habitat. This non-lethal take is intended to protect the species over the HCP term. Anticipated take thresholds are provided in Table 4-8.

Table 4-8. Summary of Effects on CRLF and Estimated CRLF Take

Covered Activity	Estimated CRLF Take over the Permit Term[1]
All covered activities in aquatic and upland habitat other than recovery activities	30 adults/sub-adults/juveniles 40 tadpoles 25 egg masses
Capture and Relocation; Non-lethal take only	300 adults/sub-adults/juveniles

Notes:

[1]This HCP does not include annual take estimates, but the annual numbers presented in the text represent a worst-case scenario. If annual take numbers approach this worst-case scenario for any life stage during any one calendar year, CDPR will initiate additional consultation with USFWS to identify any additional management activities that can be implemented. That annual trigger for consultation stands at 5 adults/sub-adults/juveniles, 5 tadpoles, and 2 egg masses from all covered activities other than recovery activities

Table 4-9. Summary of Estimated Loss of CRLF Habitat

	Annual estimated *temporary* habitat disruption	Total estimated *permanent* loss of habitat
CRLF aquatic habitat	3.0 acres riparian, wetland, and open water	1.5 acres – Oso Flaco boardwalk replacement
CRLF upland habitat	0	3 acres[1] – dust control monitoring devices

[79] Because multiple surveys were conducted, the same individual may have been observed and counted during more than one survey. In addition, in some instances a positive identification of species was not obtained.

Table 4-9. Summary of Estimated Loss of CRLF Habitat		
	Annual estimated *temporary* habitat disruption	**Total estimated *permanent* loss of habitat**
		35 acres – special projects

Note:

[1]Although the location of some meteorological monitoring stations may not be permanent, this HCP assumes that up to 3 acres of dispersal habitat could be occupied by monitoring stations at any given time. Vegetation planting associated with dust control activities is not considered a permanent loss of habitat since CRLF can use this habitat for cover and dispersal.

4.6.3 Anticipated Impacts of the CRLF Taking

This section describes the overall impacts for the anticipated take of CRLF within the HCP area and discusses the overall impacts from covered activities on the entire CRLF population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

CRLF are currently threatened by human activities, many of which operate concurrently and cumulatively with each other and with natural disturbances (e.g., droughts and floods) (USFWS 2002). Current factors associated with declining populations of the frog include degradation and loss of its habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, invasive plants, impoundments, water diversions, degraded water quality, and introduced predators (Hayes and Jennings 1988). These factors have resulted in the isolation and fragmentation of habitats within many watersheds, often precluding dispersal between sub-populations and jeopardizing the viability of metapopulations. The fragmentation of existing habitat and the continued colonization of existing habitat by invasive species may represent the most significant current threat to CRLF.

Within the HCP area CRLF have been found in Arroyo Grande Creek and Estuary, Meadow Creek, Oso Flaco Lake, Little Oso Flaco Lake, Oceano Lagoon, and a Pismo State Beach Golf Course pond. Although presence/lack of presence surveys have been conducted in the HCP area, no population assessments have been performed in areas where CRLF occur.

The permanent loss of less than one percent of modeled suitable aquatic and upland habitat within the HCP area resulting from covered activities will not substantially affect the species' population and distribution on site. Within the HCP area, CDPR will limit encroachment, when necessary, by closing suitable CRLF habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, occupied golf course ponds, and numerous unnamed water bodies within the dune system that provide existing and potential CRLF habitat. CDPR will also continue to remove invasive plant and animal species, as feasible, within aquatic habitat for CRLF to benefit this species. As a result, suitable habitat for CRLF will continue to be present within the HCP area, and CRLF are still expected to occur within these habitats. In addition, Arroyo Grande Creek and Estuary and other aquatic habitat within the HCP area will continue to provide connectivity of aquatic habitats in San Luis Obispo County and allow for dispersal opportunities in the area.

Although this HCP includes mortality or injury of up to 35 adults/sub-adults, 40 tadpoles, and 25 egg masses from all HCP covered activities over the life of the permit, this take number is a worst-case scenario, and this amount of take is unlikely to occur due to the limited sightings of CRLF within the HCP area and the implementation of AMMs listed in Table 5-5. Because CRLF population numbers do not

necessarily indicate stability (i.e., a population may have large numbers of individuals one year and then decline another), long-term evidence of successful reproduction (i.e., presence of juveniles) and survivorship into different age classes provides a better indication of population stability, persistence, and resilience (USFWS 2002). Within the HCP area, few or no CRLF have been observed within Carpenter Creek, Meadow Creek, Pismo State Beach Golf Course, Pismo Lake, Pismo Creek Lagoon, Oceano Lagoon, Little Hawaii, Meadow Creek, and Oso Flaco Creek, so a stable population is not known to exist at these sites. However, a stable population of CRLF exists within the HCP area at Arroyo Grande Creek and Estuary, Oso Flaco Lake, and Little Oso Flaco Lake. CDPR will continue to conduct surveys for CRLF in the HCP area to monitor for changes in the population size or habitat. As a result, CRLF within the HCP area will not be substantially affected. In addition, CRLF populations are not expected to be affected over the species' much larger range in California.

Additionally, conservation goals and objectives listed in section 5.2.5 and AMMs endeavor to support the Recovery Plan's overall strategy, which includes 1) protecting existing populations by reducing threats; 2) restoring and creating habitat that will be protected and managed in perpetuity; 3) surveying and monitoring populations. Specifically, Objective 2.2 and Objective 3.1 will protect and/or restore aquatic habitats and associated uplands. Objective 2.1 will minimize aquatic predator expansion and reduce existing predator populations. Successful implementation of these goals and objectives will fully offset potential take.

Objective 2.1 incorporates restoration and invasive predator control to offset any take of CRLF adults/sub-adults/juveniles and tadpoles. Specifically, CDPR is proposing to restore dune slack wetland habitat for CRLF and monitor for and remove invasive predators that might attempt to occupy the habitat (section 5.3.2.1.2). This restoration will provide habitat with maximum benefit to CRLF (high quality habitats with fewer threats from invasive predators or human disturbance). This restoration will be done in combination with other activities that preserve and enhance existing aquatic habitats and address known and emerging threats to CRLF from covered activities under an adaptive management program focused on CRLF conservation. This combination of AMMs, adaptive management, habitat restoration, invasive animal control, and management of threats will fully offset the requested take and will allow existing CRLF populations to thrive within the HCP covered lands above the baseline conditions.

4.7 Western Spadefoot

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects on WSF and potential WSF habitat from existing and new covered activities within suitable WSF habitat in the HCP area are possible and are described in the following sections. Covered activities occurring outside of WSF habitat are not anticipated to affect the species unless specifically discussed in the following sections. In addition, other covered activities that are not expected to affect western spadefoot are generally not discussed further. Table 4-10 summarizes the potential effects and potential take of western spadefoot from covered activities. AMMs that address the effects are provided in Table 5-6.

At this time, CDPR does not have a recovery permit that covers activities like surveying and monitoring WSF because the species is not listed. CDPR will update the USFWS Recovery Permit to include these recovery activities the next time this permit is amended. To provide a comprehensive understanding of the conservation program, this section includes activities that would be covered by a Recovery Permit. The effects are described in this section; however, the impacts will not be included in the ITP but rather authorized under the Recovery Permit (TE-815214-10) once it is updated to include activities for WSF.

4.7.1 Direct and Indirect Effects

Covered activities that occur within the 135 acres of suitable WSF aquatic habitat likely affect WSF, as described further in the following sections. Most of the covered activities that occur within WSF aquatic habitat likely have temporary effects (e.g., increased turbidity) on WSF aquatic habitat. In addition, many of the covered activities likely have minor effects that won't rise to a level of take of WSF.

Covered activities that occur within 4,816 acres of suitable WSF upland habitat likely also affect WSF, and WSF individuals could also wander into fully developed habitat and be at risk. Most of the covered activities that occur within WSF upland habitat likely have minor effects, as the majority of the covered activities (e.g., motorized recreation) within WSF upland habitat occur on beaches and dunes comprised of barren sand, which has limited value for WSF as burrow habitat.

Some existing covered activities, including habitat management, monitoring of WSF, and water quality monitoring and improvement projects, ultimately benefit WSF and their habitat by improving habitat quality and/or providing valuable information on WSF occurrence in the HCP area.

The following sections describe the mechanisms by which existing and new covered activities could affect WSF. Effects will be avoided and minimized to the extent feasible through existing and new AMMs. AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Chapter 5.

4.7.1.1 Park Visitor Activities

Park visitor activities have not been observed impacting WSF and likely have minimal impacts on WSF and WSF habitat. Specifically, more impactful forms of recreation (e.g., motorized recreation) are not permitted in WSF aquatic habitat, and most recreation that occurs in upland habitat occurs in lower quality WSF habitat, including beach and open dune habitat. However, in rare instances, WSF dispersing through suitable upland habitat could be directly affected if they occur in areas used by park visitors, as discussed below.

4.7.1.1.1 Motorized Recreation (CA-1)

Motorized recreation does not affect aquatic WSF habitat, as motorized vehicles are not allowed in WSF aquatic habitat.

Motorized recreation is permitted in 1,407 acres of suitable WSF upland habitat; however, the effects of motorized recreation on WSF upland habitat are not known to have occurred in the past and are expected to continue to be minimal in the future. Motorized recreation is generally limited to the beaches and dunes in the HCP area and does not permanently alter beach and vegetated upland habitat where WSF likely occur as these areas are comprised of barren sand. Although these areas are considered suitable upland dispersal habitat for WSF, this habitat is likely rarely used by WSF for dispersal over more suitable habitats since these areas provide minimal cover and are generally inhospitable to WSF. Dormant WSF are sensitive to noise, which can cause them to break dormancy and emerge at the wrong time, increasing the risk of desiccation or other harm (USFWS 2023b). Although it is not expected to occur within the SVRA given the limited overlap of OHV use and WSF habitat, an OHV generating low frequency noise and vibration operating close enough to a dormant WSF burrow could cause this effect.

Although rare, when environmental conditions are right, WSF could disperse overland through habitat used by motorized vehicles. Dispersal distances are relatively unknown for WSF, but preliminary evidence suggests that they travel less than 500 meters during periods of rain for breeding (Baumberger et al. 2019, Halstead et al. 2021, and Baumberger pers. comm. in USFWS 2023). If WSF did disperse through areas where motorized recreation occurs, WSF could be struck by vehicles and injured or killed.

However, CDPR staff have not observed a WSF in the open riding area to date. Only one suspected and incidental sighting has been observed by District staff in 2011 at the Eucalyptus Tree vegetation island. In addition, WSF would most likely disperse through these types of upland habitat at night and during rain events, when motorized recreation tends to be low. As a result, the likelihood of this happening is extremely low.

4.7.1.1.2 Camping (CA-2)

Camping in the open riding area is not expected to affect aquatic WSF habitat as camping typically occurs along the shoreline and open beaches, well away from any WSF aquatic habitat. Impacts to WSF from camping within suitable upland habitat have not been observed in the past and are anticipated to be minimal in the future. Any impacts that do occur are expected to be similar to those described above for motorized recreation (section 4.7.1.1.1).

The two designated campgrounds within the HCP area are adjacent to Meadow Creek, Carpenter Creek, and Oceano Lagoon. CDPR staff have not observed a WSF in these areas. Activities at the campground have not been known to impact WSF or their habitat to date. Pedestrian activities at the campgrounds are not expected to directly impact WSF individuals, since park visitors, including campers, are prohibited from collecting animals and plants and damaging park resources and WSF are dormant most of their lives, including during peak visitation months. Although rare, moving vehicles in the campground could inadvertently strike a WSF that has left a creek or lagoon and entered the campground; however, this has never been documented in the HCP area, and the likelihood of this happening in the future is low.

Indirect effects on WSF from camping activities include increased trash, potentially boosting predator populations (e.g., raccoons), and thereby incidentally increasing predation on WSF. To minimize this effect, CDPR will continue to inform all visitors that they must dispose of their trash in a trash dumpster, and CDPR will enforce rules to ensure the campsites are maintained clean. CDPR will also maintain set trash service in the developed campgrounds to ensure that the trash receptacles are regularly emptied and do not overflow, attracting predators. As a result, this impact will continue to be minimal.

4.7.1.1.3 Pedestrian Activities (CA-3)

Most pedestrian-based activities are considered to have little, if any, effect on WSF or its habitat since, when active, WSF tend to be found in aquatic habitats less frequented by visitors. In addition, visitor activities do not result in permanent loss of aquatic or upland habitat. As a result, it is unlikely that most pedestrian activities will directly affect WSF.

Pedestrians in suitable WSF upland habitat are unlikely to encounter a WSF and/or kill or injure a WSF, which would primarily be underground. Pedestrians that cross creeks or enter lagoons could stir up sediments and produce turbid stream flow in suitable aquatic WSF habitat. Sediment and turbidity can affect WSF by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by pedestrians crossing creeks or entering lagoons are largely temporary. Pedestrians wading into or crossing through pooled water could damage or destroy egg clusters. If surveys have identified WSF egg clusters in a location that may be vulnerable to pedestrian disturbance, CDPR will install fencing and/or signage to keep visitors away from the area. As a result, this impact will continue to be minimal.

4.7.1.1.4 Dog Walking (CA-6)

Like pedestrians, dogs have not been documented impacting WSF, but any impacts are difficult to observe and could occur without being observed. In general, dogs wading and swimming in estuaries or creeks occupied by WSF can affect water quality by depositing waste, trampling vegetation, and

temporarily increasing turbidity, thereby temporarily affecting habitat, foraging, ability to escape from predators, and reproductive success. However, dogs will continue to be required to be on a leash no longer than 6 feet and remain under the control of an owner at all times, and mutt mitts will continue to be provided in the HCP area. As a result, impacts from dog walking are considered very minimal and will remain so in the future.

4.7.1.1.5 Equestrian Recreation (CA-7)

Most equestrian-based activities occur in the northern portion of the HCP area and are considered to have little, if any, effect on WSF or its habitat since WSF tend to be found in habitats where equestrian activity does not occur and/or habitats that are less frequented by visitors. WSF would be most active in upland habitat during rain events when equestrians are least likely to be out. As a result, it is unlikely that equestrian activities will directly affect WSF in the future. It is possible the pressure from a hoof could collapse a burrow in softer soil.

If horses cross creeks or enter lagoons that are suitable habitat for WSF, they could stir up sediments and produce turbid stream flow in aquatic WSF habitat. Sediment and turbidity can affect WSF by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by horses crossing creeks or entering lagoons are largely considered to be temporary. Horses drinking from, wading into, or crossing through pooled water could damage or destroy egg clusters. If surveys have identified WSF egg clusters in a location that may be vulnerable to equestrian disturbance, CDPR will install fencing and/or signage to keep riders away from the area. As a result, this impact will be minimal.

4.7.1.1.6 Holidays (CA-10)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area on holidays. Therefore, motorized recreation on holidays does not affect WSF.

Effects on holidays from non-motorized recreation are considered to be similar to those described for camping (section 4.7.1.1.2) and pedestrian activities (section 4.7.1.1.3). The increase in visitors on holidays can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on WSF that have not previously been described.

4.7.1.1.7 Special Events (CA-11)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area during special events. Therefore, no additional effect to WSF occurs from motorized recreation during special events. In addition, Special Event permits do not authorize activities to occur in areas that would otherwise be closed to visitors; therefore, no additional impacts from non-motorized and motorized activities occur in WSF habitat that is typically off limits to visitors.

However, special events are potentially different from typical non-special event activities. First, many events tend to focus participants in the event area, which could mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Many special events occur during shoulder seasons and increase visitation at times when visitation would typically be lower. Effects on WSF from concentrating spectators and vendors in an area is likely similar to the effects described for motorized recreation (section 4.7.1.1.1), camping (section 4.7.1.1.2), and/or pedestrian recreation (section 4.7.1.1.3). The increase in visitors during special events can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on WSF that have not previously been described.

4.7.1.2 Natural Resources Management Program

4.7.1.2.1 Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (12a)

Heavy equipment is used extensively to install, maintain, and remove seasonal exclosure fencing. Fence installation involves minor leveling of sand surfaces, installation of poles and posts, trenching to allow the fence to be buried to the appropriate depth, and equipment to stretch the fence between posts. Fence maintenance will also use heavy equipment to push sand along the entire eastern fenceline to address sand build-up or erosional areas around the fence. Seasonal fence removal involves heavy equipment to remove fences, posts, and allow access for vehicles to gather used fence materials. All of this heavy equipment activity causes vibrations and noise that could impact dispersing or aestivating WSF. Most of the seasonal fences are installed in open sand areas where WSF are not likely to occur. However, some fences are close to vegetated areas (Pipeline, North Oso Flaco, 7.5 Revegetation Island) or areas with foredune development within the seasonal exclosure that could support dispersing or aestivating WSF. Heavy equipment could crush aestivating individuals or vibration from heavy equipment could force individuals out of aestivation, causing them to expend energy and making them vulnerable to predators or exposure to elements. AMMs have been developed to address some of the known threats to WSF including staff education, timing of activities for low activity periods, and having qualified biologists/Natural Resource staff survey work areas as needed. As more focused monitoring occurs and more information about WSF status and distribution in the covered lands becomes available, CDPR may develop focused AMMs to address the impacts from heavy equipment activity in areas where WSF could be dispersing or aestivating.

4.7.1.2.2 Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Habitat Manipulation. Any activity to address foredune development in the seasonal exclosure would involve heavy equipment to remove vegetation and topography in relatively small locations between 0.25 and 5 acres in size. This heavy equipment use and grading could cause vibrations or noise that could impact dispersing or aestivating WSF. Heavy equipment could crush aestivating individuals, or vibration from heavy equipment could force individuals out of aestivation, causing them to expend energy and making them vulnerable to predators or exposure to elements. As more focused monitoring occurs and more information about WSF status and distribution in the covered lands becomes available, CDPR may develop focused AMMs to address the impacts from heavy equipment activity in areas where WSF could be dispersing or aestivating.

4.7.1.2.3 Tidewater Goby and Salmonid Surveys (CA-13)

Rarely would egg clusters or WSF individuals be present within Tidewater goby survey areas. If encountered unintentionally during seining or dipnetting, CDPR biologists can affect all WSF life stages (i.e., eggs, tadpoles, juveniles, and adults) when handling individuals and egg clusters during standard fisheries surveys in Arroyo Grande Creek or during other non-routine surveys in aquatic habitats where WSF may occur. If WSF individuals or egg clusters are discovered, sampling for tidewater goby will be postponed until the eggs have hatched, or sampling will be conducted in a way that avoids all egg clusters. As a result, impacts to WSF during tidewater goby and salmonid surveys have not occurred in the past and are not expected in the future.

As part of the USFWS 10(a)(1)(A) Recovery Permit for tidewater goby, electrofishing is not allowed during tidewater goby surveys or within tidewater goby habitat; however, electrofishing is allowed in areas upstream of tidewater goby habitat under the terms of other scientific collecting permits and authorizations and is sometimes conducted for other fisheries surveys. Consequently, although unlikely, electrofishing activities could result in capture of WSF tadpoles, juveniles, or adults. Any capture

associated with electrofishing may injure or cause mortality of WSF individuals. However, effects due to electrofishing would be minimized by having a qualified biologist/Natural Resource staff conduct visual surveys during survey activities and implementing appropriate AMMs if WSF are found including rescheduling work to a less sensitive period of WSF life history, avoiding areas with WSF, or relocating individuals to suitable habitat outside the area.

Fisheries surveys require biologists to stand in water and seine/dipnet or electrofish for fish. Surveys within aquatic habitats, including activities associated with salvaging stranded tidewater gobies, can indirectly affect WSF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment that is stirred up during seining, electrofishing, and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect WSF or their habitat in the long term.

CDPR biologists or their contractors can facilitate the introduction of amphibian chytridiomycosis during fisheries surveys. Amphibian chytridiomycosis is a disease caused by the zoospore fungus pathogen *Batrachochytrium dendrobatidis* (Bd), which can cause lethargy and weakness in adult frogs and usually results in death of tadpoles. Amphibian chytridiomycosis is transported in water or mud, including in muddy footwear. To minimize the potential to spread Bd, CDPR biologists will continue to use the Recommended Equipment Decontamination Procedures (USFWS 2005b, Cleveland 2018b). This includes disinfecting equipment and clothing after entering a pond/stream or before entering a new pond where WSF may occur. Bd has not been found within the HCP area and the decontamination procedures will continue to minimize the threat. As a result, impacts associated with Bd are reduced or eliminated.

To reduce predation from invasive species, qualified biologists/Natural Resource staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrogs, largemouth bass, red-eared sliders, crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on WSF.

4.7.1.2.4 Monitoring and Management for Listed Herpetological Resources (CA-14)

Most CRLF surveys result in minimal impacts to WSF since most surveys for CRLF are eyeshine surveys conducted from the edge of the water bodies and/or kayak and only involve visually scanning for CRLF and/or egg masses. During these surveys, care is taken not to disturb sediments, vegetation, or any visible larvae. In addition, the surveys are conducted by a qualified USFWS-approved or permitted biologist/Natural Resource staff. Therefore, impacts to WSF and/or egg masses will remain minimal during eyeshine surveys.

Dipnetting surveys are infrequently conducted in the HCP area, pitfall traps may be used for WSF monitoring, and funnel traps may be deployed to survey for SWPT. These surveys are conducted by CDPR biologists or their USFWS-approved contractors for purposes of monitoring, identification, and management of these species. CDPR biologists or their contractors could affect all life stages of WSF (i.e., eggs, tadpoles, juveniles, and adults) during CRLF monitoring surveys that involve dipnetting; tadpoles, juveniles, and adults when deploying funnel traps; and adults when deploying pitfall traps. During these surveys, CDPR biologists or their contractors could capture, injure, or kill a WSF egg cluster, tadpole, juvenile, or adult. To reduce impacts associated with these surveys when they do occur, they will continue to be conducted by a USFWS-approved biologist and will continue to be conducted in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF (USFWS 2005b). As a result, although capture of WSF adults/sub-adults/juveniles, tadpoles, or eggs could occur, mortality and/or injury will continue to be minimized if not eliminated. In addition, any capture of adults/sub-adults/juveniles, tadpoles, or eggs is expected to continue to be low due to the low number of WSF that have been found in the HCP area during surveys to date.

Dipnet surveys involve biologists standing in water. Surveys within aquatic habitats affect WSF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during wading and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect WSF or their habitat in the long term.

CDPR biologists or their contractors can facilitate the introduction of amphibian chytridiomycosis when entering the water for WSF surveys. Amphibian chytridiomycosis is a disease caused by the zoospore fungus pathogen Bd, which can cause lethargy and weakness in adult frogs and usually results in death of tadpoles. Amphibian chytridiomycosis is transported in water or mud, including in muddy footwear. Therefore, CDPR biologists will use the Recommended Equipment Decontamination Procedures for CRLF (Appendix J) to minimize potentially spreading Bd. This includes disinfecting equipment and clothing after entering a pond/stream or before entering a new pond where WSF may occur. Bd has not been found within the HCP area and the decontamination procedures will continue to minimize the threat. As a result, impacts associated with Bd are reduced or eliminated.

Impacts from surveys for listed herpetological species would typically be covered by a USFWS Recovery Permit. At this time, USFWS Recovery Permit TE-815214-10 does not include WSF surveys. CDPR will include WSF in an updated Recovery Permit if the species is ultimately listed. Over the course of the HCP term, future impacts to WSF from herpetological surveys will be addressed separately with the USFWS through the Recovery Permit.

Ultimately, herpetological surveys and associated management benefit WSF by providing information necessary to contribute to conservation of the species.

4.7.1.2.5 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Activities associated with marsh sandwort, Gambel's watercress, and/or La Graciosa thistle are considered to have potential to impact WSF. Listed plant monitoring, propagation, and habitat enhancement for marsh sandwort, Gambel's watercress, and La Graciosa thistle in the HCP area are unknown to have impacted WSF. Monitoring of these species is not expected to impact WSF since this occurs on foot by a trained botanist. Any future monitoring, propagation, and habitat enhancement activities for marsh sandwort and Gambel's watercress at Oso Flaco Lake and La Graciosa thistle in aquatic habitats has the potential to temporarily impact all life stages of WSF (i.e., eggs, tadpoles, juveniles, and adults). Activities can result in injury or mortality if a WSF is present within the work area. In addition, activities can disturb WSF located near the work area and cause stress or cause them to move from cover where they may be exposed to predation.

To minimize impacts to WSF associated with these activities, ground disturbing activities in known or likely WSF habitat will be timed to avoid sensitive life stages including breeding and aestivation periods. As determined by a qualified biologist/Natural Resource staff, pre-activity surveys will be conducted where activities may pose a higher risk due to timing, location, or intensity of activity. If any WSF are found, activities will be adjusted or postponed until the qualified staff relocates the individual(s) out of harm's way or until they determine the project can proceed with minimal risk to the safety of the WSF. They may also employ protective fencing, rescheduling work times or locations, or other AMM measures where appropriate. As a result, mortality, injury, and disturbance to WSF will be minimized.

Activities within aquatic habitats affect WSF by temporarily stirring up sediment and increasing turbidity. However, any time a work activity needs to be conducted on the bed, banks, or channel of an aquatic habitat with the potential to support WSF, appropriate steps will be taken to minimize turbidity from activities. If possible, activities will be conducted from outside the wetted area or from stream banks or other upland areas. If activity is necessary in wetted areas, work will be limited to the minimum

necessary to achieve desired outcome and care will be taken to reduce turbidity, especially during critical periods like when egg clusters are present or tadpoles are present in the water. As a result, this impact will not affect WSF or their habitat in the long term.

Ultimately, listed plant habitat enhancement at Oso Flaco Lake and in other aquatic habitat where WSF may occur, benefits WSF by reducing invasive plants in the area and improving habitat in the HCP area for WSF.

Listed plant management can also occur in upland habitats where WSF burrows could be located. Activities like herbicide application could result in crushing burrows by foot traffic. Pulling weeds by hand could be more impactful because it involves more ground disturbance. It is not known if past listed plant management activities have impacted WSF. Listed plants occupy a relatively small portion of the covered lands, so any impact from listed plant management will be limited to occupied or suitable habitats. If listed plant management activities in upland areas are found to impact WSF individuals or burrows, appropriate AMMs would be implemented including avoidance of occupied upland habitat, timing of activities to avoid sensitive life stages of WSF, or relocation of individuals to appropriate habitat outside the work area.

4.7.1.2.6 Habitat Restoration Program (CA-16)

Habitat restoration conducted in the HCP area to date is not known to have impacted WSF and is part of the management program offsetting the incidental take to WSF from other covered activities; however, this management also has the potential to result in injury or mortality if a WSF is present within the work disturbance area. Restoration can directly affect all WSF life stages (i.e., eggs, tadpoles, juveniles, and adults), including by grading, ground disturbance with hand tools, vegetation removal and installation, and maintenance activities. In addition, activities can disturb WSF located near the work area and cause them to move from cover where they may be exposed to predation or desiccation. To minimize these possible impacts, depending on the type of activities (e.g., ground disturbance), surveys for WSF will be conducted, as needed, to ensure no WSF are present. If a WSF is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or determines the activities can continue with minimal risk to the safety of the WSF, which may include implementing additional AMMs such as exclusion fencing or biological monitoring. As a result, mortality, injury, and disturbance to WSF will be minimized.

4.7.1.2.7 Invasive Plant and Animal Control (CA-17)

Invasive plant or animal control activities conducted in the HCP area to date are not known to have impacted WSF. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to WSF from other covered activities; however, this management also has the potential to cause harm to WSF. CDPR biologists can directly affect all life stages of WSF (i.e., eggs, tadpoles, juveniles, and adults) by disturbing occupied habitat during standard invasive animal and plant control efforts. Invasive pest plant and animal control activities may require qualified biologists/Natural Resource staff or CDPR approved contractors to remove pest plants and animals in suitable WSF aquatic or upland habitat, including moist vegetated areas that WSF can use for dispersal. Activities like bullfrog removal can involve staff working in or adjacent to aquatic habitat which could involve the risk of crushing adults and juveniles, dislodging egg masses, stirring up sediment, or crushing burrows. To reduce impacts associated with invasive animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for WSF. Pre-activity surveys will be conducted, at their discretion, prior to commencing any activities that can disturb suitable WSF aquatic or upland habitat to minimize effects of these activities on WSF. If a WSF is observed, activities will be postponed until a qualified biologist/Natural Resource staff relocates the

individual or can proceed once they determine the activities can continue with minimal risk to the safety of the WSF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from invasive plant and animal control will be minimal.

Ultimately, invasive-pest plant and animal control in aquatic and/or upland habitat where WSF may occur benefits WSF by reducing invasive species in the area and improving habitat in the HCP area for WSF. This activity more than offsets the impacts to the species by removing vegetation and/or animals that pose a threat to WSF individuals or its habitat.

4.7.1.2.8 Water Quality Monitoring Projects (CA-19)

Water quality monitoring in the HCP area to date is not known to have impacted WSF. Installation of water quality monitoring equipment can temporarily affect WSF by disturbing individuals as workers enter occupied aquatic habitat. However, pre-activity surveys will continue to be conducted prior to commencing any activities disturbing suitable WSF aquatic habitat to minimize effects of these activities on WSF. If a WSF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the WSF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from water quality monitoring will continue to be very minimal.

Maintenance of water quality monitoring equipment within aquatic habitats can affect WSF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect WSF or their habitat in the long term.

Future projects for water quality monitoring are not known at this time. Any future projects will be evaluated for consistency with this HCP and may be permitted under a separate regulatory process, if necessary. Improvements to water quality that result from ongoing water quality monitoring and improvement projects in occupied habitat will ultimately benefit WSF by creating more suitable habitat within the HCP area.

4.7.1.3 Park Maintenance

4.7.1.3.1 Campground Maintenance (CA-20)

The two designated campgrounds within the HCP area are adjacent to Meadow Creek, Carpenter Creek, and Oceano Lagoon. Limited information is available regarding where WSF is dispersed within the park. Maintenance vehicles at the campground could inadvertently strike a WSF that has left the creek or lagoon and entered the campground area; however, this has never been reported in the HCP area to date. Any WSF dispersing through the campground area is expected to occur during the night or under wet conditions; therefore, ground-disturbing maintenance activities will continue to be avoided during heavy precipitation (i.e., at least 0.5-inch of precipitation in a 24-hour period). Maintenance activities that continue in all weather will continue to be limited to housekeeping-type routine maintenance activities such as repairs to hose bibs and changing light bulbs that are not expected to impact WSF. In addition, depending on the activities (e.g., ground disturbance, work directly adjacent to aquatic habitat), pre-activity surveys will continue to be conducted prior to campground maintenance activities. If a WSF is observed within an area subject to maintenance, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue if they determine the activities can continue with minimal risk to the safety of the individual WSF. Other measures such as exclusion fencing or biological monitoring could be employed if needed. Lastly, all maintenance personnel will

continue to receive annual training that, at a minimum, will cover WSF life history and work constraints. As a result, impacts from campground maintenance activities will be very minimal.

4.7.1.3.2 General Facilities Maintenance (CA-21)

Facilities maintenance includes sites like the levee and trail from Grand Avenue to Pismo Beach, underground infrastructure to support the corporation yard and developed campgrounds, fences around areas like the Corporation Yard, and a network of formal trails around Oceano Lagoon and the Grand Dunes. Maintenance of these facilities could include minor grading, routine vegetation control, pedestrian bridge maintenance, and other projects that could occur in or near the mapped breeding habitat for WSF. In particular, maintenance of trails, the North Beach Campground levee, and foot bridges near the Pismo State Beach monarch grove could involve work near wetlands or areas mapped as potential breeding habitat for WSF. These activities could cause injury or mortality of WSF. However, this work would be infrequent, would generally not occur at night during and immediately after rain, and standard AMMs will be followed including pre-project surveys as needed, timing projects to avoid critical life stages, and relocation of individuals if found in work areas. Impacts from these activities will be very minimal.

Mechanical trash removal is a new proposed activity. It will not occur in aquatic habitat areas or in vegetated dunes. Therefore, WSF in aquatic habitat will not be impacted. WSF may disperse through upland habitat in the geographic areas proposed for mechanical trash removal north of Post 6. Mechanical trash removal could kill or injure a WSF if it dispersed through the area while mechanical raking was occurring. However, WSF rarely disperse through open, barren sand areas where mechanical trash removal will occur. In addition, mechanical trash removal will not occur at night under wet conditions when most dispersal occurs. As a result, mechanical trash removal will be unlikely to impact WSF.

4.7.1.3.3 Routine Riparian Maintenance (CA-26)

Riparian maintenance activities are not known to have impacted WSF in the past. Riparian maintenance activities that can affect WSF include the clearing of debris, vegetation, and sediment from culverts and spillways; riparian tree and shrub vegetation control (e.g., removing or trimming vegetation); and emergent and invasive species control. WSF may occur in riparian areas where maintenance activities are located. If WSF egg clusters, tadpoles, juveniles, or adults are present in the riparian maintenance area they can be directly affected by disturbance to habitat. Individuals may be disturbed by or caught in rakes or other hand equipment used to remove sediment, debris, or vegetation. Any egg clusters or tadpoles can also be disturbed or crushed by workers or equipment during culvert and spillway maintenance and the removal of emergent vegetation. However, culvert maintenance will continue to be conducted during periods when all WSF life stages are unlikely to occur in the area (e.g., May 1 – Oct. 31 or until the first measurable fall rain of 1" or greater), to the extent feasible. If work must be conducted during the WSF breeding season, a qualified biologist/Natural Resource staff will determine whether to conduct focused surveys of the work sites. Such surveys would be conducted no more than 2 days before the onset of activities associated with projects within suitable breeding habitat for WSF (e.g., culvert maintenance). If WSF adults, tadpoles, or eggs are found, work will not commence until AMMs are in place. AMMS can include such measures as relocation, exclusion fencing with additional monitoring to prevent take along fenceline, and/or biological monitoring during maintenance activities. Furthermore, a qualified biologist/Natural Resource staff will be present, as necessary, during maintenance activities to ensure WSF are not present while work is occurring, and any herbicides used will be labeled for aquatic use. WSF life-stages found in the work area will be relocated upon their determination that an appropriate relocation site exists and relocation is the preferred avoidance method. They will be allowed sufficient time to move WSF from the work site before activities begin.

Only qualified biologists/Natural Resource staff will participate in activities associated with capturing, handling, and monitoring WSF. As a result, direct impacts to WSF from riparian maintenance are not expected in the future.

Riparian maintenance activities can temporarily result in an increase in turbidity because the in-stream vegetation traps and holds sediments. Temporarily suspended sediment can affect WSF. However, sediment stirred up during activities will continue to be minimal, localized, and temporary. In addition, heavy equipment will not be placed in the water, and backhoe work will continue to be restricted to the roadside or upper bank with only the bucket placed in the water body. Therefore, impacts associated with suspended sediments will continue to be minimized and will not affect WSF habitat in the long-term.

CDPR biologists can facilitate the introduction of Bd, which is transported in water or mud, including in muddy footwear. Therefore, CDPR biologists will continue to use the Recommended Equipment Decontamination Procedures (USFWS 2005b) to minimize potentially spreading Bd. This includes disinfecting equipment and clothing after entering a pond/stream or before entering a water body where WSF may occur. Bd has not been found within the HCP area, and the decontamination procedures will continue to minimize the threat. As a result, impacts from Bd are not expected.

Riparian maintenance activities can affect an annual maximum of approximately 0.3 acre of wetlands for culvert cleanout, debris removal, and emergent vegetation removal. In addition, approximately 2 miles of riparian corridor segments will continue to be subject to tree maintenance and invasive weed control as the need arises. Maintenance of these areas will continue to reoccur over the course of the permit, as needed, when vegetation regrows. These activities can reduce aquatic and/or riparian habitat available for WSF. However, these impacts will continue to be minor and temporary.

4.7.1.3.4 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

Thousands of linear feet of perimeter and vegetation island fencing exist throughout the open riding area designed to delineate areas open to OHVs and protect habitats from public activities. Throughout the year, these fences are repaired as sands shift. Often these repairs involve the use of heavy equipment to remove buried sections of fence and to place wooden peeler poles. This grading and equipment work has the potential to impact dune vegetation since the fences are often in close proximity to vegetation. At times, these fences can be near ephemeral breeding pools used by WSF or in areas where they aestivate. Impacts could result from grading, noise, or vibration from heavy equipment, and work within the vegetated areas (e.g., removing old fence, etc.). Fence maintenance is an almost daily occurrence within the HCP area because of the dynamic nature of the dune system. Although fence maintenance will generally not occur at night, it may occur immediately after rain events when WSF are most likely to disperse, and maintenance that includes soil movement could disturb or crush a WSF in a burrow. Standard AMMs will be followed including timing the project to minimize dispersal during and immediately after rain events and relocation of individuals if found in work areas. The impacts should be minor. As more information becomes available, consistent with Objective 1.2, additional AMMs will be identified and implemented.

4.7.1.3.5 Heavy Equipment Response (CA-29)

Heavy equipment is used throughout the park to maintain fences, maintain structures, remove hazards, transport materials, and numerous other tasks throughout the covered lands. Most activities are on bare sand where WSF are unlikely to be. However, some activities like fence maintenance around vegetated areas could impact areas where WSF are aestivating or dispersing. Heavy equipment could crush aestivating individuals or vibration from heavy equipment could force individuals out of aestivation, causing them to expend energy and making them vulnerable to predators or exposure to

elements. AMMs have been developed to address some of the known threats to WSF including staff education, timing of activities for low activity periods, and having qualified biologists/Natural Resource staff survey work areas as needed. As more focused monitoring occurs and more information about WSF status and distribution in the covered lands becomes available, CDPR may develop focused AMMs to address the impacts from heavy equipment activity in areas where WSF could be dispersing or aestivating.

4.7.1.3.6 Minor Grading (CA-30)

The specific location and timing of minor grading changes from year to year. The effects of grading to maintain seasonal exclosure fencing are included in section 4.7.1.2.1, and the effects of grading to maintain the perimeter and vegetation island fence are included in section 4.7.1.3.4. Other minor grading generally occurs in upland, non-wetland habitat, which could crush or disturb aestivating WSF, potentially impacting individuals as described for seasonal, perimeter, and vegetation island fencing.

4.7.1.3.7 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Maintenance of trail and access corridors, including boardwalks, paths, and sand ramps, is completed as needed. The frequency of this work mainly depends on visitor use and/or any weather-related damage. Vegetation intruding onto any footpaths may need to be trimmed at least once a year and is usually completed using hand tools. Vegetation trimming does not involve plant removal or disturbance of soil or aquatic habitat where WSF may occur; thus, vegetation trimming is unlikely to affect WSF habitat or individuals. Any effects on WSF aquatic habitat during boardwalk maintenance will continue to be minor and temporary, and potential for direct impacts on individuals will remain very low.

4.7.1.4 Visitor Services

4.7.1.4.1 Emergency Response (CA-33)

From time to time, law enforcement and/or medical aid must respond to an emergency located off a designated trail. When this occurs, vegetation can be trampled near an aquatic resource, or a creek might be crossed without the use of a bridge or hardened bottom. These activities can result in damage to WSF habitat. This damage is difficult to document; however, damage to habitat is considered minor and temporary.

Emergency vehicle direct impacts to WSF are difficult to document since emergency response must be implemented immediately and quickly. It is possible, but highly unlikely, that eggs, tadpoles, juveniles, or adults can be directly affected by such an incident by being struck/crushed by a vehicle. This is especially true for vehicles that must drive above the 15-mph speed limit to respond to an emergency.

Emergency response activities that cross creeks can temporarily stir up sediment and increase turbidity. However, sediment stirred up during activities is localized and temporary (lasting only during the emergency action) and will not affect WSF habitat in the long term.

4.7.1.4.2 Access by Non-CDPR Vehicles (CA-34)

Non-emergency non-CDPR vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline, following all applicable speed limits. Such vehicles do not enter the Exclosures or Oso Flaco area where vehicles are prohibited. Given the focused purpose such staff have when entering the HCP area, Impacts from their vehicles are likely less than those of motorized recreation. Effects from emergencies associated with non-CDPR vehicles, however, are similar to those effects described for CA-33, and CDPR is not always able to train non-CDPR responders. Therefore, given the travel speeds sometimes necessary for emergency response, some vehicle strikes or other harm may not be avoided.

4.7.1.4.3 Pismo State Beach Golf Course Operations (CA-37)

WSF surveys have not been completed to determine if WSF populations are present adjacent to Pismo State Beach Golf Course. If present in an adjacent ephemeral depression, WSF may disperse to Meadow Creek, Carpenter Creek, and/or the golf course ponds, especially during wet weather. If WSF disperse through the golf course to reach these locations, golf course operations and maintenance activities, such as golf cart traffic and mowers, can potentially strike WSF individuals and injure or kill them. The potential for such incidents is low because most adult WSF movement is during the rainy weather at night when no golfing or maintenance activities occur.

Maintenance activities, including mowing, are unlikely to affect WSF because maintenance activities occur during the day when WSF movement is less likely to occur and grass height at the golf course does not provide adequate cover for frogs. To further minimize effects from golf operations maintenance, ground-disturbing maintenance activities will be suspended during heavy precipitation (i.e., at least 0.5-inches of precipitation in a 24-hour period).

Maintenance of water features in the golf course can potentially disturb all life stages (i.e., eggs, tadpoles, juveniles, adults) of WSF during emergent vegetation trimming and removal or repair of bridges, although the species has never been observed within the golf course or its water features. Further, most vegetation trimming is conducted by hand. In addition, if determined to be necessary by a CDPR biologist (e.g., there is previous evidence of WSF activity from surveys), pre-activity surveys will be conducted prior to commencing any activities that may disturb suitable WSF aquatic habitat to minimize effects of these activities on WSF. If a WSF is observed, activities may be postponed until appropriate AMMs are in place, which may include relocation, exclusion fencing, and/or biological monitoring. As a result, direct impacts from aquatic maintenance activities will be reduced or eliminated.

Activities within the golf course ponds can affect WSF by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during activities is localized and temporary and will not affect WSF habitat in the long term.

4.7.1.5 Other HCP Covered Activities

4.7.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Carpenter Creek may provide suitable habitat for WSF, although focused surveys have not been performed to confirm if WSF are present. If present, WSF could be inadvertently struck by a vehicle crossing the creek; however, vehicle operators will continue to be encouraged to cross in areas with low or no flow, and all vehicles will continue to be required to travel at a speed of 15 mph or less. Therefore, effects on WSF from vehicles crossing Carpenter Creek are anticipated to be minimal in the future even if a WSF is observed in the creek.

Vehicles crossing aquatic WSF habitats affect WSF by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during vehicle crossings will be localized and temporary and will not affect WSF habitat in the long-term.

WSF have not been observed at Arroyo Grande or Oso Flaco Creek where vehicles cross since vehicles cross the creeks near the shoreline where the water salinity is too high for WSF to persist. As a result, no effects from vehicle crossings are considered to have occurred in these areas or are anticipated at these locations in the future.

4.7.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

The Pismo Creek Estuary seasonal floating bridge has not been installed at this time. The floating bridge at Pismo Creek Lagoon has a small potential to impact WSF, particularly at the northern access point.

However, to date, WSF are only known from areas farther upstream of the CDPR-owned portions of Pismo Creek. Furthermore, the Pismo Creek Lagoon is considered low quality suitable habitat for WSF due to the intrusion of saltwater. Therefore, there is low potential for WSF to be present in the area where the floating bridge would be installed. As a result, impacts associated with the floating bridge will be very minimal.

Construction activities within Pismo Creek could affect WSF by temporarily stirring up sediment and increasing turbidity. However, caution will be taken not to stir up sediment and any sediment stirred up during activities will be minimal, localized, and temporary and will not affect WSF habitat upstream of the project area.

4.7.1.5.3 Limited Trail Riding Area (CA-42)

The limited trail riding area is within potential upland WSF dispersal or burrow habitat. Given how few WSF have been found in the HCP area, it is unlikely, but possible, that WSF disperse through or occur in the trail area and could be injured or crushed during construction or subsequent maintenance and trail use. However, few WSF have been found in the HCP area, and trail construction, maintenance, and use are unlikely to occur when WSF are active on the surface (i.e., in wet weather primarily at night). Construction and maintenance could disturb, injure, or kill a WSF in its burrow, and dormant WSF are sensitive to noise, which can cause them to break dormancy and emerge at the wrong time, increasing the risk of desiccation or other harm. CDPR will implement AMMs for WSF, as appropriate, including conducting pre-activity surveys as necessary and postponing activities until the qualified biologist/Natural Resource staff determines the activities can continue with minimal risk to the safety of the WSF, which may include implementing AMMs (e.g., relocation, exclusion fencing, biological monitoring). As more focused monitoring occurs and more information about WSF status and distribution in the covered lands becomes available, CDPR may develop focused AMMs to address the impacts from heavy equipment activity in areas where WSF could be dispersing or aestivating. As a result, impacts to dormant or dispersing WSF are expected to be minimal.

4.7.1.5.4 Dust Control Activities (CA-44)

Some dust control activities are currently occurring in the HCP area, and additional dust control activities are being proposed as future activities. Future dust control activities will not occur in WSF aquatic habitat.

Future dust control activities could include planting vegetation in upland WSF dispersal or burrow habitat. Additional upland habitat will continue to be affected by air quality monitoring equipment installation. This habitat will vary in its suitability for WSF since it could occur within upland habitat anywhere within the foredunes and/or backdunes. Impacts to WSF were not observed during previous dust control activities. It is unlikely, but possible, that WSF will disperse through or be found in open sand areas prior to vegetation or monitoring equipment being installed. Individuals in a dust control work area could be injured or crushed. However, few WSF have been found in the HCP area, and additional burrow and dispersal habitat will continue to be available in the HCP area outside the dust control areas. CDPR will implement AMMs for WSF, as appropriate, including conducting pre-activity surveys as necessary and postponing activities until the qualified biologist/Natural Resource staff determines the activities can continue with minimal risk to the safety of the WSF, which may include implementing AMMs (e.g., relocation, exclusion fencing, biological monitoring). As a result, impacts to dormant or dispersing WSF are expected to be minimal. In addition, vegetation planted for dust control activities provides necessary cover for WSF if they are dispersing through the area and would benefit WSF.

4.7.1.5.5 Cultural Resources Management (CA-45)

To date, cultural resource management has not resulted in impacts to WSF. Cultural resources management is unlikely to occur when WSF are active on the surface (i.e., in wet weather primarily at night). Managing a cultural site could disturb, injure, or kill a WSF in its burrow. CDPR will implement AMMs for WSF, as appropriate, including conducting pre-activity surveys as necessary and postponing activities until the qualified biologist/Natural Resource staff determines the activities can continue with minimal risk to the safety of the WSF, which may include implementing AMMs (e.g., relocation, exclusion fencing, biological monitoring). As a result, this impact will be very minimal.

4.7.1.5.6 CDPR Management of Agricultural Lands (CA-46)

Two ditches associated with agricultural lands contain runoff from the agricultural lands and flow to Oso Flaco Lake. WSF have not been found within the agricultural ditches; however, WSF adults could be present in these areas in the future and activities could disturb or injure/kill an individual (e.g., when equipment is used to remove sediment, debris, or vegetation). CDPR will implement AMMs, including conducting activities during low flow periods (if feasible), having a qualified biologist/Natural Resource staff conduct a focused survey of the work area (subject to their discretion), and having a them present (if necessary), to reduce the potential to disturb, injure, or kill WSF. As a result, this impact will continue to be minimal.

4.7.1.5.7 Oso Flaco Lake Boardwalk Replacement (CA-48)

The Oso Flaco Lake boardwalk may eventually need to be replaced with a comparable boardwalk in roughly the same location. Most of the boardwalk is within upland habitat, but approximately 1,000 feet of the existing Oso Flaco Lake boardwalk occurs within aquatic habitat. The boardwalk also includes two resting areas/viewing platforms within aquatic habitat. The layout and/or location of the new boardwalk might need to shift slightly to accommodate conditions at the time of replacement such as changes in codes or other operational or design considerations. Thus, although it is anticipated the replacement boardwalk will be located in roughly the same location, the HCP includes the loss of up to 1.5 acres of WSF habitat. Depending on the type of repair, existing piles may need to be removed and new piles may be installed. Replacing the entire boardwalk will cause temporary disturbance of WSF aquatic habitat including substantial, but temporary, turbidity and could include pile driving and a boat or floating platform to ferry supplies; however, pre-activity surveys will be conducted prior to commencing any activities disturbing suitable WSF habitat to minimize effects of these activities on WSF. If a WSF is observed, activities will continue to be postponed until a qualified biologist/Natural Resource staff relocates the individual or can proceed once they determine the activities can continue with minimal risk to the safety of the WSF, which may include implementing AMMs. In addition to relocation, AMMs may include exclusion fencing, biological monitoring, or other measures. As a result, impacts from Oso Flaco Lake boardwalk replacement will be minimal.

As noted, this activity has the potential to stir up sediment and cause turbidity in the lake. It is not known how much turbidity could impact resident WSF. A project of this scale will trigger various permits from regulatory agencies including the U.S. Army Corps of Engineers and the Regional Water Quality Control Board. CDPR will follow the requirements of those permits and implement any best management practices needed to reduce the impacts from sediment from pile removal and replacement on aquatic organisms in Oso Flaco Lake, including WSF.

4.7.1.5.8 Special Projects (CA-49)

Specific special projects or project designs are not known at this time. Any special projects, such as the replacement or expansion of existing facilities or the construction of new facilities will directly affect WSF habitat if the special project occurs within WSF habitat. Effects of special projects in WSF upland

habitat, such as installing a new vault toilet, will be similar to those discussed in dust control activities (section 4.7.1.5.3). No special projects will occur in aquatic habitat or near enough to aquatic habitat to have an effect on WSF or suitable aquatic habitat. Dormant WSF are sensitive to noise, which can cause them to break dormancy and emerge at the wrong time, increasing the risk of desiccation or other harm (USFWS 2023b). Although it is not expected to occur within the SVRA given the limited overlap of special projects and WSF habitat, heavy equipment generating low frequency noise and vibration operating close enough to a dormant WSF burrow could cause this effect. Additionally, special projects could remove up to 35 acres of dispersal habitat, but this habitat impact would be minor since suitable dispersal habitat would still be present throughout the HCP area. As more focused monitoring occurs and more information about WSF status and distribution in the covered lands becomes available, CDPR may develop focused AMMs to address the impacts from heavy equipment activity in areas where WSF could be dispersing or aestivating.

4.7.1.5.9 Use of Pesticides (CA-51)

Pesticides are currently used in the HCP area in upland and near aquatic habitat; however, the effects of pesticides on WSF are not well documented (USFWS 2023b). As a result, this section discusses potential effects that could occur to WSF.

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, there is potential for indirect effects in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species; moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general; rather, any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Very few pesticides are tested for toxic effects to amphibians. Most studies look at mammals, birds, fish, and insects. In the absence of robust toxicity data for amphibians in aquatic habitats, the EPA uses fish toxicity as a surrogate. For example, in a 2008 study, EPA compiled toxicity studies for technical glyphosate (formulated without a surfactant) on species deemed suitable to act as WSF surrogates. Results ranged from practically non-toxic to slightly toxic with the lowest (i.e., most conservative) acute toxicity LC50 value (i.e., the lethal concentration of a chemical causing 50 percent mortality of test animals) of 43 milligrams active ingredient per liter (mg/L), and the lowest no-observed-adverse-effect level of 30.6 mg/L (EPA 2008).

A description of the location where each pesticide is used in the HCP area in relation to WSF habitat and the anticipated effects of each pesticide on WSF follows.

Glyphosate is proposed to be used in upland habitats and aquatic formulations of Glyphosate (Rodeo® and Aquamaster®) are proposed to be used in aquatic habitats within the HCP area for control of invasive plants, including within WSF breeding and dispersal habitat. As stated above, glyphosate is not expected to be toxic to WSF in aquatic habitats. Glyphosate toxicity data for amphibians that inhabit terrestrial environments is also lacking. EPA uses toxicity data from avian receptors as a surrogate for WSF in terrestrial environments (EPA 2008). These studies showed that glyphosate is slightly toxic to the selected avian species, with the lowest LD50 value (i.e., dose required to kill 50 percent of a population of test animals) reported as ingestion of greater than 3,196 mg of active ingredient per kilogram of body weight (EPA 2008); however, no mortalities occurred in any of the studies, so this number is likely to be strongly conservative.

Fluazifop-P-butyl has been rated as highly toxic to aquatic and terrestrial amphibians (White 2007). However, CDPR does not use Fluazifop-P-butyl near aquatic systems in the HCP area; it is only used for spot treatment in terrestrial habitats when Russian wheatgrass, veldt grass, and European beach grass are intermixed with native plants. In addition, contractors only apply Fluazifop-P-butyl when wind speeds are low (less than 10 mph) and rain is not predicted in the next 48 hours. As a result, effects from Fluazifop-P-butyl on WSF are not expected.

The aquatic formulation of imazapyr (Habitat®) is proposed to be used adjacent to aquatic habitats, including WSF breeding habitat, in the HCP area to control invasive plants once an APAP is issued. The EPA's 2007 risk assessment indicates that no direct effects are expected on either the aquatic or terrestrial phase of WSF from imazapyr (EPA 2007). There are also no indirect effects expected for WSF through direct effects to either its terrestrial or aquatic food sources. The effects determination for direct effects on WSF and for indirect effects through food sources is "no effect." Some indirect effects to WSF may occur due to direct effects on habitat and/or primary productivity (i.e., ecosystem structure and function for both the aquatic plant community and riparian vegetation).

Triclopyr is used to treat Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near WSF breeding habitat. Given that no scientifically valid triclopyr toxicity data are available for aquatic-phase amphibians, freshwater fish data were used as a surrogate to estimate direct acute and chronic risks to WSF. Freshwater fish toxicity data were also used to assess potential indirect effects of triclopyr to WSF. The EPA's 2009 risk assessment on triclopyr indicates that no direct effects are expected on either the aquatic or terrestrial phase of WSF from triclopyr (EPA 2009). Effects on freshwater fish resulting from exposure to triclopyr indicate WSF may be indirectly affected via reduction in available food.

Aminocyclopyrachlor is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near WSF breeding habitat. The EPA (2010) classifies aminocyclopyrachlor as practically non-toxic or only slightly toxic to mammals, birds, fish, and aquatic invertebrates (SERA 2012). There is no information regarding the toxicity of aminocyclopyrachlor to aquatic-phase amphibians. In view of this lack of data, the EPA follows a standard approach in that freshwater fish (i.e., rainbow trout and bluegill sunfish) are used as surrogates for aquatic phase amphibians. No toxicity data are available for terrestrial-phase amphibians, so no dose-response can be derived (SERA 2012).

Chlorsulfuron is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near WSF breeding habitat. No ecotoxicity studies have been conducted for the effects of Chlorsulfuron on amphibians, but it has been found not to pose a risk to fish or aquatic invertebrates from direct spray, off-site drift, or surface runoff (ENSR International 2005). It has been found to have a very low potential to cause adverse effects in aquatic animals (SERA 2004) and has been rated as practically non-toxic to aquatic amphibians (White 2007).

Aminopyralid is used to control Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near WSF breeding habitat. Only one study on the effects of Aminopyralid on amphibians has been conducted, which indicated that leopard frog larvae are no more sensitive to aminopyralid than fish (SERA 2011a). Aminopyralid has been shown to be practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates. There are no known acute or chronic risks to non-target endangered or non-endangered fish, birds, wild mammals, terrestrial and aquatic invertebrates, algae, or aquatic plants .

Sethoxydim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, WSF in aquatic habitat are not impacted. Neither the published literature nor the EPA files include data regarding the

toxicity of sethoxydim to amphibian species. Sethoxydim is moderately to slightly toxic to fish . The acute static LC50 values for technical grade sethoxydim range from 170 to 265 parts per million (mg/L) in bluegill sunfish and rainbow trout, respectively (BASF 1982 as cited in). The formulated product, Poast®, however, is much more toxic with LC50 values of 2.6 ppm in bluegill sunfish and 1.2 ppm in rainbow trout Bowman and Howell (1991) as cited in SERA (2011a). The higher toxicity in Poast® is likely attributable to the presence of naphtha solvent. However, WSF in upland habitat are unlikely to be impacted since they only occur in upland habitat during dispersal events. In addition, WSF typically disperse at night, and herbicides are only applied during the day.

Clethodim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, WSF in aquatic habitat are not impacted. There is no information regarding the toxicity of clethodim to terrestrial-phase amphibians in the open literature or in the available EPA studies . In the absence of information on terrestrial-phase amphibians, the EPA uses birds as a surrogate. Clethodim is practically non-toxic to birds.

VectoBac G is applied by helicopter over large areas in the HCP area, which could include occupied WSF aquatic and upland habitat. VectoBac G is toxic only to the larvae of certain diptera. It does not directly or indirectly harm other aquatic, marine, or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® or Renegade EA® on WSF. The product safety data sheets state that these products have not been classified as environmentally hazardous (Wilbur-Ellis 2016a, 2016b). However, one study found that glyphosate-surfactant mixtures, such as Competitor®, were more toxic to western toad than glyphosate alone (Vincent and Davidson 2015). CDPR will use only herbicides that are approved for aquatic use in aquatic habitats, including WSF breeding habitat.

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area is expected to benefit WSF by preventing invasive plants from taking over WSF habitat or providing hiding places for predators. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to covered species are expected to decrease with increasing distance away from the treated field or site of application. CDPR takes extra precautions when applying pesticides near open water and wetlands and other sensitive habitats that support covered species. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Table 5-6 are considered to reduce or eliminate these impacts.

4.7.2 Anticipated Take of Western Spadefoot

This section quantifies the potential for incidental take of WSF due to the effects described in the preceding sections. Although many of these covered activities described are currently occurring in the HCP area, very little is known about the actual impacts on WSF since WSF take associated with park visitor activities has not been observed and few WSF have ever been documented in the HCP area. The number of WSF that may be killed or injured because of covered activities is difficult to quantify for the following reasons: 1) the number and location of WSF within a population vary from year to year; and 2) the aquatic nature of WSF, and the relatively small body size of WSF, particularly tadpoles and egg masses, makes finding a dead or injured WSF of any life stage unlikely. Therefore, this HCP attempts to

quantify take levels (i.e., harm, pursue, wound, kill, trap, capture or collect, or to attempt to engage in these activities) in the HCP area that could occur and go undetected, especially given the low abundance of WSF in the HCP area and the difficulty in finding them.

Table 4-10 presents threshold levels of WSF adults/sub-adults, tadpoles, and egg masses that may be detected as killed or injured over the permit term due to covered activities(referred to as "non-recovery" activities/actions) not specific to recovery activities that would be authorized under a Recovery Permit. These threshold levels represent limits for take from covered activities. The HCP also recognizes that for every WSF found dead or injured, other individuals may be killed or injured that are not detected. As a result, the estimation of take is considered a worst-case scenario and is not expected to occur in most years, if at all.

CDPR has no records of WSF take in the HCP area to date. Take may occur as a result of covered activities in suitable WSF upland habitat and during covered activities within suitable WSF aquatic habitat (Map 29). Although AMMs will be implemented to minimize take, a small amount of take may occur incidental to these activities.

In addition, WSF will be captured and relocated during dipnet surveys, if conducted, and a subset of these captured individuals could be killed or injured due to mishandling or stress. Appendix C describes possible impacts to WSF from surveys and other recovery activities that will be authorized by an updated USFWs Recovery Permit if the species is ultimately listed.

The distribution of WSF within the SVRA requires more study, and it is assumed that they may inhabit additional aquatic areas subject to park visitor activities, park maintenance, visitor services, and other HCP covered activities. Specific existing and/or new park visitor activities, park maintenance, visitor services, and other HCP covered activities that could affect WSF include the following:

- Motorized activities (CA-1)
- Camping (CA-2)
- Pedestrian activities (CA-3)
- Dog Walking (CA-6)
- Equestrian recreation (CA-7)
- Holidays (CA-10)
- Special events (CA-11)
- SNPL and CLTE monitoring and management (CA-12b) – habitat manipulation
- Listed plant management (CA-15)
- Habitat restoration program (CA-16)
- Invasive pest plant and animal control (CA-17)
- Water quality monitoring projects (CA-19)
- Campground maintenance (CA-20)
- General facilities maintenance (CA-21)
- Routine riparian maintenance (CA-26)
- Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

- Heavy Equipment Response (CA-29)
- Boardwalk and Other Pedestrian Access Maintenance (CA-31)
- Emergency response (CA-33)
- Access by Non-CDPR Vehicles (CA-34)
- Pismo State Beach Golf Course maintenance in water features (CA-37)
- Motorized crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
- Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)
- Limited trail riding area (CA-42)
- Dust control activities (CA-44)
- Cultural resource management (CA-45)
- CDPR management of agricultural lands (i.e., drainage ditch maintenance) (CA-46)
- Oso Flaco Lake boardwalk replacement (CA-48)
- Special projects (CA-49)
- Use of Pesticides (CA-51)

Additionally, up to 1.5 acres of WSF habitat could be permanently affected by the replacement of the Oso Flaco boardwalk and viewing platform at Oso Flaco Lake (Table 4-11). Up to 35 acres could be affected by special projects, and some additional areas could be closed for dust control planting. Any vegetation planted for dust control should ultimately benefit WSF as it converts open sand to a more hospitable vegetated habitat and would not be considered habitat loss. Up to 3 additional acres would be modified for temporary air quality monitoring equipment. A maximum of 1.0 acre of wetland and open water habitat will continue to be temporarily impacted each year by routine riparian maintenance, Pismo State Beach Golf Course maintenance, and/or CDPR management of agricultural lands drainage ditch maintenance. Additionally, a maximum of 2.0 acres of riparian corridor segments will be subject to temporary spot treatments for continued tree maintenance and invasive weed control as the need arises during the life of the HCP. This short-term habitat disruption will not result in a permanent habitat reduction but may increase disturbance and/or the potential for mortality of WSF that could inhabit the disturbed area.

In addition to WSF habitat loss, this HCP proposes take authorization in aquatic and upland habitat for WSF adults/sub-adults/juveniles, tadpoles, and egg masses. Only adults/sub-adults/juveniles will be affected by covered activities in upland habitat since tadpoles and egg masses only occur in aquatic habitat. As stated previously, CDPR has no records of WSF take in the HCP area to date, and take of WSF in the HCP area is difficult to quantify due to the small number of WSF confirmed present in the HCP area and due to the small size of individuals. This species has only been detected incidentally on Eucalyptus Tree Vegetation Island (suspected sighting) and Oso Flaco Lake, and it is not known if it will be found in the northern portions of the HCP area or how large of a population is present. WSF is anticipated to rarely occur in the upland habitat in the HCP area during rain events for dispersal and will likely stay in vegetated areas that are off-limits for OHV activity. WSF movements during dry periods are substantially low, and WSF would only be expected to occur infrequently in the upland habitat in the HCP area since most of the upland area is dominated by beaches and barren sand that does not provide habitat features necessary for aestivation and other uses. Nonetheless, if present near Pismo Creek, and nearby Meadow and Carpenter Creeks, it could disperse to other adjacent areas. If WSF encroaches

Pismo State Beach Golf Course, including the golf course ponds, it could be crushed or injured by golf course management, such as mowing. AMMs, including environmental awareness training for golf course maintenance staff, will continue to reduce the potential for WSF incidental take. Additionally, if WSF disperse to North Beach and Oceano Campgrounds individuals could be crushed or injured by maintenance activities (e.g., mowing) and/or park visitor vehicles could crush or injure WSF in the campground area. However, potential WSF dispersal into these areas would only be expected during periods of rain and at night when covered activities are limited.

While most of the natural resource management activities that could affect WSF will be authorized by a future amendment to the USFWS Recovery Permit as outlined in Appendix C, there is the potential for incidental take of WSF from listed plant management, invasive plant and animal control activities, and water quality monitoring.

Listed plant monitoring, propagation, and habitat enhancement and water quality monitoring may involve working in the water or on adjacent banks and upland habitat with the potential for impacting eggs or individuals and sediment impacts. These activities will be conducted in coordination with qualified biologists/Natural Resource staff to ensure AMM implementation. Invasive plant and animal control may disturb occupied habitat and include activities like bullfrog removal or the trapping of red-eared sliders and crayfish. These activities may involve installing funnel traps, direct targeting of individuals, and other work in aquatic habitats which could result in injury or death of WSF. Funnel traps could inadvertently trap a WSF. Direct targeting of bullfrog could also injure or harm WSF. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to WSF from other covered activities; however, this management also has the potential to cause harm to WSF. To reduce impacts associated with invasive animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for WSF. Any take from these activities will be described in this HCP and not through a USFWS Recovery Permit.

Only a small portion of WSF in the HCP area is anticipated to be injured or killed due to covered activities. However, this HCP provides a worst-case estimate of take to account for individuals that may not have been observed injured or dead in the past. Therefore, this HCP estimates that a maximum of 8 adults/sub-adults/juveniles, 15 metamorphs/tadpoles, and 2 egg masses could be crushed, injured, or killed in a year due to covered activities. Actual take is expected to be substantially lower in most years given the marginal quality of many aquatic habitats within the HCP area, the few documented sightings of WSF within the HCP area, and the AMMs that will be implemented. Because WSF are not likely to be injured or killed each year, this HCP provides an estimate of WSF that could be crushed, injured, or killed over the permit term. As a result, this HCP estimates that a maximum of 20 WSF adults/sub-adults/juveniles, 50 tadpoles, and 20 egg masses could be injured or killed due to covered activities over the permit term. Additionally, over the term of the HCP, CDPR anticipates handling up to 250 individuals (adults/juveniles/tadpoles) to relocate them out of harm's way and into suitable habitat. This non-lethal take is intended to protect the species over the HCP term. Anticipated take thresholds are provided in Table 4-10.

Table 4-10. Summary of Effects on Western Spadefoot and Estimated Western Spadefoot Take

Covered Activity	Estimated Take Individual WSF over the Permit Term[1]
All covered activities in aquatic and upland habitat other than recovery activities	20 adults/sub-adults/ juveniles 50 metamorph/tadpoles

Table 4-10. Summary of Effects on Western Spadefoot and Estimated Western Spadefoot Take	
Covered Activity	**Estimated Take Individual WSF over the Permit Term[1]**
	20 egg masses
Capture and Relocation, non-lethal take only	250 adults/sub-adults/ Juveniles

Note:

[1] This HCP does not include annual take estimates, but the annual numbers presented in the text represent a worst-case scenario. If annual take numbers approach this worst-case scenario for any life stage during any one calendar year, CDPR will initiate additional consultation with USFWS to identify any additional management activities that can be implemented. That annual trigger for consultation stands at mortality/injury of 8 adults/sub-adults/juveniles, 15 metamorphs/tadpoles, and 2 egg masses from all covered activities other than recovery activities.

Table 4-11. Summary of Estimated Loss of Western Spadefoot Habitat		
	Annual estimated *temporary* habitat disruption	**Total estimated *permanent* loss of habitat**
Spadefoot aquatic habitat	3.0 acres riparian, wetland, and open water	1.5 acres – Oso Flaco boardwalk replacement
Spadefoot upland habitat	0	3 acres[1] – dust control monitoring devices 35 acres – special projects

Note:

[1]Although the location of some meteorological monitoring stations may not be permanent, this HCP assumes that up to 3 acres of dispersal habitat could be occupied by monitoring stations at any given time. Vegetation planting associated with dust control activities is not considered a permanent loss of habitat since WSF can use this habitat for cover and dispersal.

4.7.3 Anticipated Impacts of the Western Spadefoot Taking

This section describes the overall impacts for the anticipated take of WSF within the HCP area and discusses the overall impacts from covered activities on the entire WSF population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

Major threats to WSF populations primarily include habitat loss and fragmentation (Baumberger et al. 2019; Rose et al. 2020, 2022) as well as predators such as bullfrogs and fish that may feed on adults or larvae or adults (Jennings and Hayes 1994). These factors have resulted in the isolation and fragmentation of habitats within many watersheds, often precluding dispersal between sub-populations and jeopardizing the viability of metapopulations. The fragmentation of existing habitat and the continued colonization of existing habitat by invasive species may represent the most significant current threat to WSF.

Within the HCP area, WSF has been found at Oso Flaco Lake and one suspected sighting at Eucalyptus Tree Vegetation Island. Although presence/lack of presence surveys have been conducted in the HCP area, no population assessments have been performed in areas where WSF occur.

The permanent loss of less than one percent of modeled suitable aquatic and upland habitat within the HCP area resulting from covered activities will not substantially affect the species' population and distribution on site. Within the HCP area, CDPR will limit encroachment, when necessary, by closing suitable WSF habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential WSF habitat. CDPR will also continue to selectively remove invasive plant and animal species, as feasible, within aquatic habitat for WSF to benefit this species. As a result, suitable habitat for WSF will continue to be present within the HCP area, and WSF are still expected to occur within these habitats. In addition, Arroyo Grande Creek and Estuary and other aquatic habitat within the HCP area will continue to provide connectivity of aquatic habitats in San Luis Obispo County and allow for dispersal opportunities in the area.

Although this HCP includes mortality or injury of up to 60 adults/sub-adults, 50 tadpoles, and 20 egg masses from all HCP covered activities over the life of the permit, this take number is a worst-case scenario, and this amount of take is unlikely to occur based upon the few documented sightings of WSF within the HCP area and the implementation of AMMs listed in Table 5-6. It is unknown if stable population sizes exist at sites where WSF has been incidentally observed within the HCP area. CDPR will conduct surveys for WSF in the HCP area to monitor for changes in the population size or habitat and ensure that measures are in place to avoid impacts to this species. As a result, WSF within the HCP area will not be substantially affected. In addition, WSF populations are not expected to be affected over the species' much larger range in California.

Additionally, conservation goals and objectives listed in section 5.2.6 and AMMs will contribute toward recovery of WSF populations. Specifically, Goals 2 through 4 are designed to not only protect but also restore aquatic habitats and associated uplands. For example, by meeting Objective 3.1, CDPR will minimize non-native aquatic predator expansion and reduce existing non-native predator populations. In addition, AMMs will continue to minimize impacts to WSF during population surveys. Successful implementation of these goals and objectives will fully offset potential take.

Objective 3.1 incorporates restoration and invasive predator control to offset any take of WSF adults/juveniles or tadpoles. Specifically, CDPR is proposing to restore dune slack wetland habitat for WSF and monitor and remove invasive predators that might attempt to occupy the habitat (section 5.3.2.1.2). This restoration will provide habitat with maximum benefit to WSF (high quality habitats with fewer threats from invasive predators or human disturbance). This restoration will be done in combination with other activities that preserve and enhance existing aquatic habitats and address known and emerging threats to WSF from covered activities under an adaptive management program focused on WSF conservation. This combination of AMMs, adaptive management, habitat restoration, invasive animal control, and management of threats will fully offset the requested take and will allow existing WSF populations to thrive within the HCP covered lands.

4.8 Tidewater Goby

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects on tidewater goby and potential tidewater goby habitat from existing and new covered activities in the HCP area are possible and are described in the following sections. Covered activities occurring outside of tidewater goby habitat (Map 17) are not anticipated to affect the species unless specifically discussed in the following sections. In addition, other covered activities that are not expected to affect tidewater goby are generally not discussed further. Table 4-12 summarizes the potential effects and potential take of tidewater goby from covered activities. AMMs that address the effects are provided in Table 5-7. Impacts from activities covered by the USFWS Recovery Permit are outlined in this section;

however, those impacts will not be included in the ITP but rather under Recovery Permits (TE-815214-10 or TE-101154-03, and successors).

4.8.1 Direct and Indirect Effects

Covered activities that can affect tidewater goby occur within 45 acres of tidewater goby habitat. Of this area, 10 acres occur adjacent to where street-legal vehicle activity is allowed, and 35 acres are open to pedestrians or CDPR personnel only.

Covered activities that occur within tidewater goby habitat are considered to have minor, temporary effects on tidewater goby habitat; however, some injury or mortality of tidewater goby can still occur (section 4.8.1.5.3).

Some existing covered activities, including habitat management, fisheries monitoring, and water quality monitoring and improvement projects ultimately benefit tidewater gobies and their habitat by improving habitat quality and/or providing valuable information on tidewater goby occurrences in the HCP area.

The following sections describe the mechanisms by which existing and new covered activities can affect tidewater goby. Effects will continue to be avoided and minimized, to the extent feasible, through AMMs. AMMs reducing the effects are briefly mentioned here and are described in greater detail in Table 5-7.

4.8.1.1 Park Visitor Activities

4.8.1.1.1 Motorized Recreation (CA-1)

For the specific effects of vehicles crossing Arroyo Grande Creek, see section 4.8.1.5.1. No other effects on tidewater goby from public motorized recreation are known to occur.

4.8.1.1.2 Pedestrian Activities (CA-3)

Pedestrian activities have not been documented impacting tidewater goby; however, any impacts are difficult to observe, and some impacts can occur. Pedestrian activities will continue to have mostly minor effects on tidewater goby, such as a temporary increase in turbidity when crossing suitable tidewater goby habitat. Even in areas of high visitor use, pedestrians are considered to pose little to no threat to tidewater gobies and/or their habitat. However, pedestrian activities could affect tidewater goby in limited circumstances as described below.

Visitors wading in the Pismo Creek Lagoon and Arroyo Grande Creek and Estuary can trample or injure tidewater gobies or collapse tidewater goby breeding burrows. Visitors wading and/or swimming in Pismo Creek Lagoon and Arroyo Grande Creek and Estuary can also disturb habitat, injure/kill fish, or make individuals more susceptible to predation by startling them from protected areas and/or making them more visible to predators. However, the ponded areas of Arroyo Grande Creek and Estuary will continue to be closed to pedestrians during the peak tidewater goby breeding season (generally early spring to late summer) to minimize the disturbance to breeding tidewater gobies. In addition, a floating bridge (section 4.8.1.5.2) may be installed in the future across the Pismo Creek Lagoon to minimize disturbance to tidewater gobies in this area. Overall, impacts from wading visitors are considered minor and will continue to be minimal in the future.

In large enough amounts, loss of bank and in-stream vegetation due to visitors building small rock dams and rock crossings or collecting driftwood for campfires can lead to an increase in water turbidity and a decrease in water quality. In addition, pedestrians crossing creeks can stir up sediments and temporarily increase turbidity. In large amounts, temporarily suspended sediment can adversely affect aquatic

species, including tidewater gobies. Increased turbidity can reduce visibility for tidewater gobies, which could result in reduced foraging success, difficulty escaping from predators, and reduced reproductive success. Increased sediment during the tidewater goby breeding season can cover coarse sand and/or fill the interstitial spaces between the sands, limiting oxygen to tidewater goby eggs. Layers of silt on top of coarse sand can also make the substrate unavailable for spawning. However, sediment stirred up during activities, including creek crossings, rock dam construction, and driftwood collection is typically minimal, localized, and temporary and does not affect tidewater goby or tidewater goby habitat in the long term. This impact will continue to be minimal in the future.

4.8.1.1.3 Dog Walking (CA-6)

Like pedestrians, dogs have not been documented impacting tidewater goby, but any impacts are difficult to observe and can occur. In general, dogs wading and swimming in estuaries and creeks occupied by tidewater goby can affect water quality by depositing waste, trampling vegetation, and temporarily increasing turbidity, thereby temporarily affecting spawning habitat, foraging, ability to escape from predators, and reproductive success. However, dogs will continue to be required to be on a leash no longer than 6 feet and remain under the control of an owner at all times, and mutt mitts will continue to be provided in the HCP area. As a result, impacts from dog walking are considered minimal and will be very minimal in the future.

4.8.1.1.4 Equestrian Recreation (CA-7)

Horses also have similar effects on tidewater goby as pedestrians and dogs wading and swimming in estuaries occupied by tidewater goby (section 4.8.1.1.2 and 4.8.1.1.3). Equestrians, however, generally cross Arroyo Grande Creek upstream of tidewater goby habitat; therefore, equestrian activities typically avoid potential tidewater goby habitat. Any impacts to tidewater goby from equestrian recreation are considered minimal and will be minimal in the future.

4.8.1.1.5 Holidays (CA-10)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area on holidays. Therefore, no additional impact to tidewater goby occurs from motorized recreation on holidays.

Effects on holidays from non-motorized recreation are similar to those described for pedestrian activities (section 4.8.1.1.2). Additional visitors on holidays could increase the amount of trash in the HCP area or the number of visitors/dogs that wade within estuaries and creeks; however, this increase would not likely result in additional effects on tidewater goby that have not previously been described.

4.8.1.1.6 Special Events (CA-11)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area during special events, and no additional effects on tidewater gobies have been observed from motorized recreation during special events. In addition, Special Event Permits do not authorize activities to occur in areas that will otherwise be closed to visitors; therefore, no additional impacts from non-motorized and motorized activities occur in tidewater goby habitat that is typically off limits to visitors.

Special events are potentially different from typical non-special event activities. First, many events tend to focus participants in the event area, which could mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. However, any increase in visitors during special events is not likely to result in an increase of visitors in tidewater goby habitat. Therefore, any increase in visitors during special events will not result in additional effects on tidewater goby that have not previously been described.

4.8.1.2 Natural Resources Management Program

4.8.1.2.1 Tidewater Goby and Salmonid Surveys (CA-13)

Only CDPR biologists and/or contractors with a 10(a)(1)(A) Recovery Permit for tidewater goby and/or USFWS/NOAA Fisheries approval conduct tidewater goby and salmonid surveys. Qualified and permitted biologists/Natural Resource staff or contractors can capture all life stages of tidewater goby during seining associated with regular fisheries monitoring. In the HCP area since 2005, between zero and tens of thousands of tidewater gobies have been captured during surveys (Table 3-14). Tidewater gobies can also be injured or even killed during seining associated with monitoring fisheries populations, although this is rare and has only been documented on a few occasions with a maximum of three individuals being injured or killed. Mortality or injury can occur if fish become tangled in seine nets, burrows are trampled during survey work, and/or spawning substrates are disrupted during survey activities. AMMs are in place to minimize the potential for mortality and/or injury during tidewater goby and salmonid surveys, including, but not limited to, having a USFWS- and/or NOAA-fisheries approved biologist conduct the surveys, conducting the surveys in accordance with the guidelines described in the Recovery Plan for tidewater goby (USFWS 2005a), using the smallest and lightest seine nets practicable, immediately releasing any tidewater gobies that appear stressed, and limiting dipnetting and seining to no more than 40 percent of the survey area (or 20 percent during the breeding season). In addition, no electrofishing is allowed in tidewater goby habitat to avoid injuring or killing a tidewater goby during electrofishing activities. In the rare cases when surveying biologists encounter a tidewater goby (or a CRLF), they cease electrofishing and move upstream to a point presumably free from their occupancy. As a result, impacts from tidewater goby and salmonid surveys are minimal and will continue to be minimal or eliminated in the future.

Surveys can also disturb substrates including tidewater goby burrows, stir up sediments, and temporarily increase turbidity. Increased turbidity can reduce visibility for tidewater gobies, which could result in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if this occurs in the breeding season. However, USFWS Recovery Permit terms and conditions limit the extent of substrate disturbance by limiting the area seined during each survey event, thus minimizing the impact of survey activities. Sediment stirred up during activities is therefore minimal, localized, and temporary and does not affect tidewater gobies or their habitat in the long term.

Ultimately, tidewater goby surveys benefit tidewater goby by providing information necessary to contribute to conservation of the species. Impacts from fisheries surveys will be covered under the USFWS Recovery Permit (TE-815-214-10 or TE-101154-03, and successors).

Additionally, capturing tidewater gobies that have been isolated in pools or are in danger of mortality from low water conditions and relocating them into suitable habitat necessarily involves handling gobies, which could pose a risk of injury or mortality. This salvage effort will ultimately allow individuals to survive, benefitting the local tidewater goby population.

4.8.1.2.2 Monitoring and Management for Listed Herpetological Resources (CA-14)

When possible and appropriate, eyeshine and visual encounter surveys will continue to be conducted within tidewater goby habitat in a manner that minimizes disturbance to tidewater gobies. Such surveys have little (if any) impact on tidewater gobies since they are conducted out of water or from a kayak.

When dipnet surveys are necessary to survey for herpetological species, tidewater gobies could be captured in dipnets if the surveys occur in tidewater goby habitat. Tidewater goby egg burrows can also be disturbed or crushed if the dipnet survey is conducted during the tidewater goby breeding season. In addition, captured tidewater goby individuals could be injured or even killed when caught in the dipnet. However, dipnet surveys will continue to be conducted in a manner that minimizes disturbance to

aquatic habitat when the SWPT, CRLF, or WSF habitat overlaps with tidewater goby habitat, and any captured fish will be released immediately at the capture site. Tidewater goby could potentially be trapped by a SWPT funnel trap, but traps would be checked frequently, and any captured fish would be released. As a result, impacts from herpetological surveys will continue to be minimized.

Dipnet surveys could also stir up sediments and temporarily increase turbidity since surveyors must enter the water on foot to conduct the survey. Increased turbidity can reduce visibility for tidewater gobies, resulting in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if the survey occurs during the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary, and does not affect tidewater goby or its habitat in the long term.

4.8.1.2.3 Listed Plant Management Activities (CA-15)

Listed plant monitoring, propagation, and habitat enhancement for marsh sandwort and Gambel's watercress in the HCP area to date are not known to have impacted tidewater goby. Monitoring of marsh sandwort and Gambel's watercress is not expected to impact tidewater goby since tidewater goby have not been found in Oso Flaco Lake where marsh sandwort and Gambel's watercress are found.

Activities within aquatic habitats affect tidewater goby by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during listed plant management activities will be minimal, localized, and temporary. As a result, this impact will not affect tidewater goby or their habitat in the long term.

Ultimately, listed plant habitat enhancement at Oso Flaco Lake and in other aquatic habitat where tidewater goby may occur, benefits tidewater goby by reducing invasive plants in the area and improving habitat in the HCP area.

4.8.1.2.4 Invasive Plant and Animal Control (CA-17)

Invasive plant and animal control activities may require CDPR Natural Resource staff to remove pest plants and animals in tidewater goby habitat (see section 4.8.1.5.3 for pesticide discussion). CDPR biologists can temporarily disturb tidewater goby individuals and habitat during invasive animal and plant control efforts. In addition, CDPR biologists can inadvertently step on tidewater goby burrows or injure tidewater goby individuals if these activities occur during the breeding season. To minimize these impacts, activities within tidewater goby habitat will continue to be avoided, if possible. If it is not possible to avoid activities in tidewater goby habitat and activities require that work be conducted in the water, only one person will enter the water to ensure disturbance to tidewater goby and its habitat is minimized. As a result, these impacts are considered minimal.

Invasive plant and animal control activities can also indirectly affect tidewater goby by temporarily stirring up sediment and increasing turbidity, as described previously. Sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater goby or its habitat in the long term. In addition, to prevent erosion and sedimentation in tidewater goby habitat, vegetation removal and bank disturbance associated with invasive plant control will continue to be kept to a minimum.

Invasive animal control may include activities like bullfrog removal or the trapping of red-eared sliders and crayfish. These activities may involve installing funnel traps, direct targeting of individuals, and other work in aquatic habitats which could result in injury or death of tidewater goby. Removal of invasive or other non-native aquatic species is part of the management program specifically designed to offset the incidental take to tidewater goby from other covered activities; however, this management also has the potential to cause harm to tidewater goby. To reduce impacts associated with invasive

animal control, these control methods will be conducted by qualified biologists/Natural Resource staff trained in those methods. They will also be familiar with identification and avoidance measures for tidewater goby. Any take from these focused predator control activities will be described in this HCP and not through a USFWS Recovery Permit.

4.8.1.2.5 Water Quality Monitoring Projects (CA-19)

Installation of water quality monitoring equipment (e.g., gauges, telemetry) can temporarily affect tidewater goby by disturbing individuals during installation, removal, operation, and maintenance of instruments. Monthly or bi-monthly grab samples may also be collected in Oso Flaco, Pismo, and Arroyo Grande estuaries. The chances of a tidewater goby being inadvertently collected by a water (grab) sample is very low. In addition, these activities will continue to be monitored by qualified biologists/Natural Resource staff, so effects will continue to be localized, temporary, and very minor.

Water quality monitoring activities can also indirectly affect tidewater goby by temporarily stirring up sediment and increasing turbidity, as described previously. Sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater goby or its habitat in the long term.

4.8.1.3 Park Maintenance

4.8.1.3.1 Routine Riparian Maintenance (CA-26)

Riparian maintenance activities that can affect tidewater goby include culvert maintenance and emergent vegetation removal when these activities are located near or within occupied habitat. Culvert maintenance occurs in Carpenter Creek, where tidewater goby was first recorded in 2012. Tidewater goby has the potential to persist in the creek in the future. As a result, riparian maintenance activities in Carpenter Creek can impact tidewater goby. However, as Carpenter Creek dries, tidewater gobies are found in pools, which often form at a distance from the culverts and vegetation that are impacted by the maintenance activities; therefore, direct impacts from culvert maintenance and vegetation removal do not occur when the water pools. Tidewater goby individuals, however, can be injured or killed, and egg burrows can be crushed during these activities if the water encroaches on the riparian maintenance work area and tidewater gobies are present near the culverts or vegetation. To minimize these effects, maintenance activities will continue to be conducted during the dry season or when the creek is not actively flowing or at its lowest flow, if possible. In addition, all maintenance personnel will continue to receive training prior to activities that, at a minimum, covers tidewater goby life history and work constraints, and any herbicides used will be labeled for aquatic use. A pre-activity survey will also continue to be conducted prior to performing activities in tidewater goby habitat. As a result, these impacts will continue to be minimized.

Culvert maintenance occasionally requires a backhoe bucket to enter the water. The bucket can stir up sediments and temporarily affect downstream water quality by increasing turbidity. In addition, removing vegetation around the culverts can stir up sediments and increase turbidity. Increased turbidity can reduce visibility for tidewater gobies, which could result in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if this occurs during the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater goby or its habitat in the long term. In addition, to prevent erosion and sedimentation in tidewater goby habitat, vegetation removal and bank disturbance associated with riparian maintenance activities will continue to be kept to a minimum.

Riparian maintenance activities can affect tidewater goby habitat if an equipment leak or spill occurs and enters the water. Refueling and maintenance of equipment will continue to occur at least 60 feet from riparian habitat and appropriate spill containment will continue to be kept on site at all times so

any spills can be cleaned immediately. As a result, effects on water quality from riparian maintenance activities are minimal.

4.8.1.3.2 Heavy Equipment Response (CA-29)

Heavy equipment (e.g., loader, tractor) is utilized throughout the HCP area, potentially within ponded areas, such as for recovering stranded vehicles or deceased marine life. Tidewater gobies could be injured or killed during these activities, and egg burrows could be crushed if the activities occurred in the breeding season. To reduce the potential to injure or kill tidewater goby or crush egg burrows, CDPR will minimize placing heavy equipment and personnel in ponded areas, although it may not be possible in all scenarios. The potential thus exists for tidewater gobies to be directly affected. The effects from turbidity and potential equipment leaks would be similar to minor grading (CA-30).

4.8.1.3.3 Minor Grading (CA-30)

Most grading activities will continue to occur on land and will not occur in or near tidewater goby habitat; therefore, these activities do not affect tidewater goby. In the future, if grading activities occurred in or near tidewater goby habitat, tidewater gobies could be injured or killed during these activities and egg burrows could be crushed if the activities occurred in the breeding season. To reduce the potential to injure or kill tidewater goby or crush egg burrows, CDPR will continue to ensure that no heavy equipment is placed in the water body during minor grading. As a result, direct impacts from minor grading would not occur.

Any personnel that enter the water during minor grading can stir up sediments, temporarily affecting downstream water quality by increasing turbidity. Increased turbidity can reduce visibility for tidewater gobies, resulting in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if the activity occurs during the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary and will not affect tidewater goby or its habitat in the long term.

Minor grading activities can affect tidewater goby habitat if an equipment leak or spill occurs nearby tidewater goby habitat and enters the water. Refueling and maintenance of equipment will continue to occur at least 60 feet from riparian habitat and appropriate spill containment will continue to be kept on site so any spills can be cleaned immediately. As a result, effects on water quality from riparian maintenance activities are very minimal.

4.8.1.4 Visitor Services

4.8.1.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

For the specific effects on tidewater goby from patrols crossing Pismo/Carpenter and Arroyo Grande Creeks, see section 4.8.1.5.1. No other effects on tidewater goby occur from these patrols.

4.8.1.4.2 Emergency Response (CA-33)

From time to time, law enforcement and/or medical aid must respond to emergencies. When this occurs, some trampling of riparian vegetation may occur or a creek (e.g., Carpenter Creek) may be crossed without the use of a bridge or hardened bottom. Impacts to tidewater goby from emergency activities are not known; though highly unlikely, eggs, juveniles, or adults could be crushed, injured, or killed by such an incident. Potential damage to habitat is likely minor and temporary since any impacts would occur from a vehicle driving through quickly or from foot traffic associated with the emergency.

Emergency vehicles crossing creeks or emergency personnel entering water bodies occupied by tidewater gobies can stir up sediments, temporarily affecting downstream water quality by increasing turbidity. Increased turbidity can reduce visibility for tidewater gobies, resulting in reduced foraging

success, difficulty escaping from predators, and reduced reproductive success if the activity occurs during the breeding season. However, sediment stirred up during activities will be minimal, localized, and temporary and will not affect tidewater gobies or their habitat in the long term.

4.8.1.4.3 Access by Non-CDPR Vehicles (CA-34)

Non-emergency non-CDPR vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline, following all applicable speed limits. Such vehicles do not enter the Exclosures or Oso Flaco area where vehicles are prohibited. Given the focused purpose such staff have when entering the HCP area, Impacts from their vehicles are likely less than those of motorized recreation. Effects from emergencies associated with non-CDPR vehicles, however, are similar to those effects described for CA-33, and CDPR is not always able to train non-CDPR responders. Therefore, given the travel speeds sometimes necessary for emergency response, some mortality or other harm may not be avoided.

4.8.1.5 Other HCP Covered Activities

4.8.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Oso Flaco, and Arroyo Grande Creeks (CA-40)

Tidewater gobies in the HCP area are believed to be flushed from the northern San Luis Obispo County estuary populations during high-volume storm events and transported, via the north-south longshore current, to estuaries to the south, including the HCP area. Tidewater gobies flushed from Pismo Creek Lagoon or other northern estuaries, may enter Arroyo Grande Creek and Estuary during or just after storm events. Therefore, the mouth of Arroyo Grande Creek has potential to function as a migration route for tidewater gobies during high-flow, winter flood events (Rischbieter, Douglas, pers. comm. 2012). A discovery (Rischbieter 2017) of two tidewater goby individuals at the mouth of Oso Flaco Creek also makes Oso Flaco Creek a potential migration route for tidewater gobies. Arroyo Grande Creek is crossed by the public, as well as CDPR staff. Pismo Creek and Oso Flaco Creek are only crossed by CDPR maintenance and monitoring crews and no public vehicles are allowed. All vehicles cross the creeks near the shoreline. No impacts to tidewater goby egg burrows occur from vehicles crossing these creeks because the respective shallow sandy stream segments, where such crossing occurs, is not suitable habitat for tidewater goby spawning or rearing. Under normal conditions (i.e., dry weather or low-volume storm events), routine vehicle traffic crossing at Arroyo Grande Creek or Oso Flaco Creek likely has no impact on tidewater goby or its habitat because vehicles are prohibited from crossing the creek in any manner other than crossing as close to the ocean waterline as possible. In general, fish typically do not use the surf-line outlet reach. Ponded areas of Arroyo Grande Creek and Estuary, where tidewater goby does occur, are posted as closed to vehicles, thus protecting tidewater goby from vehicles. Therefore, vehicle crossing of the creek at the waterline is unlikely to affect tidewater goby individuals.

Under certain conditions, especially in the winter, the extent of the ponded areas in Arroyo Grande Creek and Estuary can shift significantly between tides and sometimes even between successive wave sets. Even though motor vehicles are prohibited from traversing these ponded areas, it is not feasible for CDPR staff to move fencing and closure signage each time the area changes, and visitors may not know they are prohibited from driving through the ponded areas. Under such circumstances, it is possible individual tidewater gobies could be disturbed or even injured or killed by vehicles driven by visitors across Arroyo Grande Creek. However, because of the transitory nature of the ponding in these beach areas, and because such ponding is typically induced by high-water events (which usually occur outside the breeding season), it is unlikely that breeding burrows occur in the area. Therefore, no impacts to tidewater goby burrows are expected to occur.

CDPR staff and/or contractor vehicles do not cross through ponded areas at the mouth of Pismo Creek. In the past, patrol vehicles infrequently drove through the Pismo/Carpenter Creek confluence when traveling to the North Beach Campground. This activity could have destroyed breeding burrows and/or killed/injured individual tidewater gobies in that area. However, CDPR staff and/or contractors will continue to avoid crossing through ponded water where possible. If ponded water cannot be avoided, CDPR staff and/or contractors will attempt to cross at the shallowest area possible to minimize impacts to tidewater gobies. Therefore, impacts to tidewater gobies from crossing the Pismo/Carpenter Creek confluence are presumed to be minimal.

Crossing creeks could stir up sediment, which could affect downstream reaches of creeks by increasing turbidity. However, the quality of habitat in the lowest reaches (i.e., sand banks, sandy channel) of the creeks does not appear to be significantly altered by vehicle traffic, owing largely to the naturally transitory and dynamic nature of sandy features near the surf line and through the beach (Rischbieter 2006). In addition, any effects from increased turbidity are minor, localized, and temporary and do not affect tidewater gobies in the long term.

4.8.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

The Pismo Creek Estuary seasonal floating bridge has not been installed at this time. The bridge is expected to reduce erosion and sedimentation into the Pismo Creek estuary by reducing the number of pedestrians walking through the mouth of the creek. Therefore, the bridge is expected to benefit tidewater goby and its habitat by reducing the effects from turbidity and the potential for tidewater goby individuals to be injured or killed.

To ensure the bridge does not block tidewater goby passage when it is installed, and to allow movement of all fish species as well as an exchange of fresh and saltwater, even during low flows, the interlocking pieces of the bridge will be constructed to create wide openings under the bridge. In addition, the bridge will be removed if water levels are so low that it is not allowing the free movement of fish in the estuary. The bridge could also result in shadow or other disturbances to the surface of the water when pedestrians cross the bridge, which could cause temporary disturbances to tidewater goby. However, the bridge will cover a very small area of the estuary, and such disturbances are expected to result in only minor effects on tidewater goby or its habitat. As a result, impacts will be minimal, and the decreased turbidity and direct impacts to individual tidewater gobies will provide an overall net benefit to tidewater goby.

4.8.1.5.3 Use of Pesticides (CA-51)

Pesticides are currently used in the HCP area near aquatic habitat; however, the effects of pesticides on tidewater goby is not well documented. As a result, this section discusses potential effects that could occur to tidewater goby.

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, potential for indirect effects exists in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species; moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general. Any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

A description of the location where each pesticide is used in the HCP area in relation to tidewater goby habitat and the anticipated effects of each pesticide on tidewater goby follows.

The aquatic formulation of Glyphosate (e.g., Roundup Custom®) is proposed to be used in aquatic habitats for control of invasive plants once an APAP is issued, including in tidewater goby habitat. Glyphosate has been used to control invasive plants since the 1970s. During this period, there have been no documented cases of adverse effects on fish associated with glyphosate (Giesy, Dobson and Solomon 2000). The aquatic formulation of imazapyr (Habitat®) is proposed to be used adjacent to aquatic habitats. Both imazapyr and glyphosate have very low toxicity to fish, posing virtually no risk of fish kills. In aquatic areas, herbicides are generally applied during a low or receding tide when water is not present, so residual amounts that may reach the water on the returning tide are small and rapidly diluted. The risk characterization for aquatic animals is somewhat less variable than for aquatic plants. Except for an accidental spill, exposure scenarios involving fish do not appear to present a risk (SERA 2011a). Exposure for fish from imazapyr can occur via direct contact to surface water that may contain the herbicide due to runoff after ground application. Imazapyr was undetectable in the initial tidal exchange waters following the direct application of the compound to estuarine sediments in field tests by Washington State University. Bioaccumulation of imazapyr in aquatic organisms is low; therefore, the potential of exposure through ingestion of exposed aquatic invertebrates or other food sources to fish is reduced. Imazapyr is considered practically non-toxic (insignificant) to fish based on tests conducted using standardized EPA protocols (Washington Department of Agriculture 2017). EPA completed a biological evaluation for glyphosate and determined glyphosate is likely to adversely affect tidewater goby (EPA 2021a). Future consultation between EPA and USFWS may result in additional mitigation measures for glyphosate use (EPA 2021b), which may or may not be applicable to the HCP area.

Fluazifop-P-butyl has been rated as slightly to moderately toxic to cold water fish (White 2007). However, CDPR does not use Fluazifop-P-butyl near aquatic systems in the HCP area; it is only used for spot treatment in upland habitat when Russian wheatgrass, veldt grass, and European beach grass are intermixed with native plants.

Triclopyr is used to treat Cape ivy in the HCP area, which typically occurs on or near willows in freshwater aquatic habitats; therefore, this pesticide is not expected to be used near tidewater goby habitat. In addition, triclopyr amine salt formulation, which is the formulation used in the HCP area, is rated as practically non-toxic to cold water and warm water fish (White 2007).

Aminocyclopyrachlor is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near tidewater goby habitat. The EPA (2010) classifies aminocyclopyrachlor as practically non-toxic or only slightly toxic to mammals, birds, fish, and aquatic invertebrates (SERA 2012).

Chlorsulfuron is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near tidewater goby habitat. Indirect exposure to birds, fish, or amphibians to chlorsulfuron can occur when they eat contaminated prey or vegetation. Direct exposure can occur when birds, fish, or amphibians contact chlorsulfuron residues with their skin or eyes or when they inhale chlorsulfuron vapors or particulates. CDPR's current application rates and use patterns for chlorsulfuron pose a negligible risk to wildlife. Fish do not appear particularly susceptible to chlorsulfuron toxicity (SERA 2004). Chlorsulfuron does not bioaccumulate (i.e., build up) in wildlife or fish; therefore, the risk to fish that eat exposed aquatic insects or other contaminated food sources is low.

Aminopyralid is used to control Cape ivy in the HCP area, which typically occurs on or near willows in freshwater aquatic habitats; therefore, this pesticide is not expected to be used near tidewater goby habitat. In addition, in Dow AgroSciences laboratory testing, aminopyralid has been shown to be "practically non-toxic" (Class 0) to birds, fish, honeybees, earthworms, and aquatic invertebrates, which is the EPA's least toxic category (EPA 2005, DOW Chemical Company AgroSciences 2008).

Clethodim has been rated as slightly to moderately toxic to fish and aquatic invertebrate species (SERA 2014). However, CDPR does not use clethodim near aquatic systems in the HCP area and a 200-foot buffer is implemented during clethodim use around aquatic resources. Clethodim is only used in upland habitat when needed for veldt grass removal.

Sethoxydim has been rated as moderately to slightly toxic to aquatic species (SERA 2001). However, CDPR does not use sethoxydim near aquatic systems in the HCP area and a 200-foot buffer is implemented during sethoxydim use around aquatic resources. Sethoxydim is only used in upland habitat when for veldt grass removal.

VectoBac G is applied by helicopter over large areas in the HCP area, which could include tidewater goby habitat. VectoBac G is toxic only to the larvae of certain diptera. It does not harm other aquatic, marine or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® and Renegade EA® on tidewater goby. The product safety data sheets for these surfactants state that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a). CDPR will use only herbicides that are approved for aquatic use in aquatic habitats, including tidewater goby habitat.

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific avoidance and minimization measures for pesticide use, pesticide use within the HCP area is expected to benefit tidewater goby by preventing aquatic invasive plants from reducing tidewater goby habitat quality. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to covered species are expected to decrease with increasing distance from the treated field or site of application. CDPR takes extra precautions when applying pesticides near open water and wetlands and other sensitive habitats that support covered species. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in section 5.3.1.6 are considered to reduce or eliminate these impacts.

4.8.2 Anticipated Take of Tidewater Goby

This section quantifies the potential for incidental take of tidewater goby due to the effects described in the preceding sections. Although many of these covered activities described are currently occurring in the HCP area, very little is known about the actual impacts on tidewater goby since tidewater goby take associated with park activities has not been observed. The number of tidewater gobies that may be killed or injured due to covered activities is difficult to quantify for the following reasons: 1) tidewater goby is difficult to detect because of its small body size, 2) finding a dead or injured specimen is unlikely and has rarely been observed by CDPR (Rischbieter, Douglas, pers. comm. 2024b), 3) finding a carcass and assigning a cause of death can be problematic, especially in the presence of numerous scavengers that are likely to find the animals soon after they die, and 4) the populations of tidewater goby in the HCP area are influenced by seasonal and/or annual events (e.g., drought or flood events) and thus fluctuate within the HCP area. Therefore, this HCP attempts to quantify take levels (i.e., harm, pursue, wound, kill, trap, capture or collect, or to attempt to engage in these activities) in the HCP area that could occur and go undetected, especially given the difficulty in observing tidewater goby. Specific existing and/or new park visitor activities, park maintenance, visitor services, and other HCP covered activities that could affect tidewater goby include the following:

- Motorized activities (CA-1)
- Pedestrian activities (CA-3)
- Dog walking (CA-6)
- Equestrian recreation (CA-7)
- Holidays (CA-10)
- Special events (CA-11)
- Tidewater goby and salmonid surveys (CA-13) – Tidewater goby salvage
- Invasive plant and animal control (CA-17)
- Water quality monitoring projects (CA-19)
- Routine riparian maintenance (CA-26)
- Minor grading (CA-30)
- Ranger, Lifeguard, and Park Aide Patrols (CA-32)
- Emergency response (CA-33)
- Access by Non-CDPR Vehicles (CA-34)
- Motorized crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
- Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)
- Use of pesticides (CA-51)

Table 4-12 summarizes the estimates for take of tidewater goby due to covered activities (referred to as "non-recovery" activities/actions) not specific to recovery activities authorized under Recovery Permit TE-815214-10. These threshold levels represent limits for take from covered activities. The HCP also recognizes that for every tidewater goby found dead or injured, other individuals may be killed or injured that are not detected.

Tidewater gobies may be killed or injured during invasive animal control or routine riparian maintenance. They may also be injured or killed by visitors, CDPR staff, or non-CDPR staff driving through occupied habitat (i.e., ponded areas of Arroyo Grande Creek and the confluence of Pismo Creek and Carpenter Creek), as well as by non-motorized park visitors traversing such habitat.

CDPR has no records of tidewater goby injury or mortality from park visitor activities and only three have been observed injured or killed during tidewater goby surveys. Although AMMs will be implemented to minimize take (Table 5-7), a small amount of take may still occur. Impacts to tidewater goby for recovery activities like surveys and seining will be authorized by USFWS Recovery Permit TE-815214-10 or TE-101154-03. Appendix C outlines the impacts from surveys and recovery activities for tidewater goby.

Park visitor activities including walking dogs, equestrians, and pedestrians wading in tidewater goby habitat (i.e., Pismo Creek Lagoon and Arroyo Grande Creek and Estuary) can injure or kill tidewater goby individuals or collapse or crush tidewater goby burrows. Incidental take of tidewater goby individuals and/or their burrows from park visitors is difficult to document but is likely rare and localized.

Under normal conditions (i.e., dry weather or low-volume storm events), routine vehicle traffic crossing at Arroyo Grande Creek likely has no impact on tidewater goby or its habitat because vehicles are

prohibited from crossing the creek in any manner other than crossing as close to the ocean waterline as possible. In general, tidewater gobies typically do not occupy the surf-line outlet reach of these streams.

Ponded areas of Arroyo Grande Creek and Estuary, where tidewater gobies do occur, are posted as closed to vehicles, thus protecting tidewater goby and breeding burrows from vehicles. However, under certain conditions, especially in the winter, the extent of the ponded areas in Arroyo Grande Creek can shift significantly between tides and sometimes even between successive wave sets. Even though motor vehicles are prohibited from traversing these ponded areas, it is not feasible for CDPR staff to move fencing and closure signage each time the area changes, and visitors may not know they are prohibited from driving through the ponded areas. As a result, a visitor may drive through Arroyo Grande Creek and injure or kill a tidewater goby. CDPR vehicles are less likely to mistakenly cross through ponded areas at the mouth of Oso Flaco Creek, Pismo Creek, or Arroyo Grande Creek. However, when traveling to North Beach Campground, patrol vehicles have driven through the Pismo/Carpenter Creek confluence and, although unlikely, may collapse or crush a breeding burrow or injure/kill tidewater goby individuals.

Only a small portion of tidewater gobies in the HCP area is anticipated to be injured or killed due to covered activities. However, this HCP provides a worst-case estimate of take to account for individuals that may not have been observed injured or dead in the past. Therefore, this HCP estimates that a maximum of 5 tidewater gobies could be injured or killed in a year due to covered activities. Actual take is expected to be substantially lower in most years given the limited extent of covered activities occurring within potentially occupied habitat and the AMMs that will be implemented. Because tidewater gobies are not likely to be injured or killed each year, this HCP provides an estimate of tidewater gobies that could be injured or killed over the permit term. As a result, this HCP estimates that a maximum of 15 adult tidewater gobies could be injured or killed due to covered activities over the permit term. Additionally, over the term of the HCP, CDPR anticipates capturing up to 50 adult tidewater gobies that have been isolated in pools or are in danger of mortality from low water conditions and relocating them into suitable habitat. This salvage effort (non-lethal take) is intended to protect the species over the HCP term. Anticipated take thresholds are provided in Table 4-12.

A maximum of 5 acres of tidewater goby habitat may be temporarily affected by motorized vehicles driving through suitable habitat (Map 30) if the ponded areas shift. The 5 acres include potentially ponded areas of Arroyo Grande Creek and the confluence of Carpenter Creek and Pismo Creek. Table 4-13 summarizes the estimate of temporary disruption to tidewater goby habitat from vehicular crossings.

Table 4-12. Summary of Effects on Tidewater Goby and Allowable Tidewater Goby Take

Activity	Allowable Take of Individual Tidewater Goby over the Permit Term[1]
All covered activities other than recovery activities	15
Capture and Relocation, non-lethal take only	N/A[2]

Notes:

[1]This HCP does not include annual take estimates, but if annual take numbers approach a defined worst-case scenario for any life stage during any one calendar year, CDPR will initiate additional consultation with USFWS to identify any additional management activities that can be implemented. That annual trigger for consultation stands at mortality/injury of 5 individual adult tidewater gobies from all covered activities other than recovery activities.

[2]No limit is placed on the number of relocated tidewater gobies. CDPR estimates capture and relocation of 50 stranded tidewater gobies over the HCP term.

Table 4-13. Summary of Estimated Loss of Tidewater Goby Habitat		
	Annual estimated *temporary* habitat disruption	**Total estimated *permanent* loss of habitat**
Tidewater goby habitat	5.0 acres (motorized vehicles)	0

4.8.3 Anticipated Impacts of the Tidewater Goby Taking

This section describes the overall impacts for the anticipated take of tidewater goby within the HCP area and discusses the overall impacts from covered activities on the entire tidewater goby population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

Population dynamics are not well documented for tidewater goby. Deriving population size estimates for the tidewater goby is difficult because of the variability in local abundance. In addition, seasonal changes in distribution and abundance further hamper efforts to estimate population size, especially for a short-lived species. Tidewater goby populations also fluctuate greatly with changing environmental conditions (e.g., drought, El Niño) among years; this environmental variation is a normal phenomenon, but one that makes the determination of trends difficult (USFWS 2005a). Both drought and flood events can locally extirpate tidewater goby (Rischbieter 2009a, 2015), as can habitat disturbances such as artificial lagoon breaching (Swift, Mulder, et al. 2018). Recolonization can subsequently occur from other local waters, which in turn can be followed by development of once-again thriving populations (Rischbieter 2017).

Swift et al. (1989) reported 87 localities where the tidewater goby was historically known to occur, although 134 localities were known at the time of publication of the Recovery Plan (USFWS 2005a). Twenty-three (17 percent) of the 134 documented locations were considered extirpated, and 55 to 70 (41 to 52 percent) localities are naturally so small or have been so degraded over time that long-term persistence is uncertain (USFWS 2005a).

Currently, at least two range-wide tidewater goby studies are underway or have been recently completed. Tidewater goby presence/ lack of presence surveys, habitat assessments, and specimen collections were completed in 122 coastal wetlands in the fall of 2014, 2015, 2017, and 2018. Surveys spanned from Salmon Creek, Sonoma County, to San Luis Rey River, San Diego County, and took between 8 and 10 weeks to complete each year. The primary focus of these extensive survey efforts was to gather multiple years of range-wide occupancy data to properly inform a new metapopulation viability analysis model and establish a baseline for continued work across the region (Spies and Jacobs 2022).

Additional range-wide eDNA studies have also been completed. Sutter (2018)used environmental DNA (eDNA) to monitor the presence or lack of presence of tidewater goby throughout their range. This study distinguished results between the “northern” tidewater goby (*Eucyclogobius newberryi*) and the recently described southern populations (*E. kristinae*). Across their combined geographic range, a total of 209 sites were surveyed from Del Norte to San Diego counties between May and September of 2016. Among these sites, 12 were dry during the survey; among the 197 sites with water present, tidewater goby were detected at 81 out of 175 sites, and southern tidewater goby were detected at 4 out of 22 sites. Martel (2019) built on this work by using occupancy modeling to estimate rangewide metapopulation dynamics in Tidewater Goby.

As described above, estimating tidewater goby population size is complicated because the populations are controlled by environmental conditions. For example, when lagoons are breached due to flood

events during the rainy seasons, tidewater goby populations decrease and then recover during the following summer. Swift et al. (1989) estimated that individual tidewater gobies within a population at Aliso Creek Lagoon ranged from 1,000 to 1,500 in the late winter–early spring and 10,000 to 15,000 tidewater goby in the late summer–early fall. In the HCP area, regular fisheries surveys have been conducted at Arroyo Grande Creek and Estuary since 2003. Population size has regularly fluctuated from zero to tens of thousands.

The conservation program fulfills several of the recovery objectives by including seasonal monitoring of the Arroyo Grande Creek and Estuary and periodic monitoring of Pismo Creek Lagoon and Oso Flaco Lagoon (if present) to assess the status of tidewater goby populations.

This HCP will continue to conserve all of the modeled potential suitable habitat within the HCP area. The tidewater goby population in the HCP area naturally fluctuates due to environmental conditions on a seasonal basis. The annual temporary disruption of 10 percent of modeled suitable habitat within the HCP area (where Pismo Creek and Arroyo Grande Creek flow over their sandbars) will not substantially affect the species' distribution on site since suitable habitat will still remain available. Although a maximum take of 15 individual tidewater gobies over the permit term is listed in Table 4-12, this is a worst-case scenario and the actual take of tidewater gobies is anticipated to be lower. Therefore, a maximum take of 15 individuals over a 25-year period from covered activities will not substantially affect the species' population on site because take is expected to be lower and—although the overall population of tidewater gobies in the HCP area fluctuates—tidewater goby population size has been documented up to tens of thousands in a year. Overall, habitat protection, invasive predator removal, and improvement in habitat quality will fully offset potential take, and the population of tidewater goby in the HCP area is expected to continue to contribute to the overall metapopulation dynamics and long-term viability of the Conception Recovery Unit.

In addition to removal of non-native species found during normal surveys, Tidewater Goby Conservation Objective 2.1 proposes invasive predator control activities to offset any take of goby. Specifically, CDPR is proposing to remove up to 3 bullfrogs/non-native fish or up to 5 crayfish from important aquatic habitats for each individual goby that is incidentally taken during the HCP term (section 5.3.2.1.4). Invasive predator control will be focused in habitat areas where there will be maximum benefit to goby (high quality habitats with fewer threats or areas of potential expansion). Additionally, tidewater gobies stranded and at risk of mortality due to low water conditions will be captured and relocated to suitable habitat. The invasive predator control and salvage efforts will be done in combination with other activities that preserve and enhance existing aquatic habitats and address known and emerging threats to tidewater goby from covered activities under an adaptive management program focused on goby conservation. This combination of AMMs, adaptive management, habitat enhancement, invasive animal control, and management of threats will fully offset the requested take and will allow existing tidewater goby populations to thrive within the HCP covered lands.

4.9 Summary of the Potential for Take

Table 4-14 summarizes CDPR's assessment of the potential for each covered activity to cause incidental take, both prior to and with implementation of AMMs. As noted in section 4.1, not every effect is considered take. Further, this HCP assesses the likelihood of take based on whether take is "reasonably certain" to occur, considering both direct and indirect effects (USFWS and NOAA Fisheries 2016). This standard is applied in the following order: 1) Is the species present within the affected area? 2) If so, could the species be exposed to stressors caused by the covered activities? and 3) If so, would the species' biological response to that exposure correspond to the definition of take? The ''reasonable certainty'' standard does not require a guarantee that a take will result, rather, only that there is a rational basis for a finding of take.

Using this approach, the following activities have been determined to not cause take of any of the covered species even in the absence of AMMs: Street Sweeping (CA-25), ASI Courses (ATV and RUV; CA-35), and Grover Beach Lodge and Conference Center (CA-38). The following activities have been determined to not cause take of any of the covered species once AMMs are implemented: Listed Plant Management (CA-15), WHPP Implementation (CA-18), Water Quality Monitoring Projects (CA-19), Campground Maintenance (CA-20), Wind Fencing (CA-23), Sand Ramp and Other Vehicular Access Maintenance (CA-24), Cable Fence Maintenance and Replacement (CA-28), Boardwalk and Other Pedestrian Access Maintenance (CA-31), Natural History and Interpretation Programs (CA-39), Replacement of the Safety and Education Center (CA-43), and Cultural Resources Management (CA-45).

Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation												
Covered Species:	**SNPL**		**CLTE**		**SWPT**		**CRLF**		**WSF**		**Tidewater Goby**	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
Park Visitor Activities												
CA-1 Motorized Recreation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CA-2 Camping	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
CA-3 Pedestrian Activities	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CA-4 Bicycling and Golfing	Y	Y	Y	Y	N	N	N	N	N	N	N	N
CA-5 Fishing	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
CA-6 Dog Walking	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	N
CA-7 Equestrian Recreation	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
CA-8 Boating/Surfing	Y	Y	Y	Y	N	N	N	N	N	N	N	N
CA-9 Aerial/Wind-Driven Activities	Y	Y	Y	N	N	N	N	N	N	N	N	N
CA-10 Holidays	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CA-11 Special Events	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation												
Covered Species:	**SNPL**		**CLTE**		**SWPT**		**CRLF**		**WSF**		**Tidewater Goby**	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
Natural Resources Management												
CA-12a SNPL and CLTE Protective Fence Installation & Maintenance (fence strike/entanglement only)	Y	Y	Y	Y	N/A[1]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CA-12b SNPL and CLTE Monitoring & Management (Larger habitat manipulation and AMM 22 only)	Y	Y	N	N	N	N	N	N	Y	Y	N	N
CA-13 Tidewater Goby and Salmonid Surveys (monitoring)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CA-13 Tidewater Goby and Salmonid Surveys (tidewater goby salvage)	N	N	N	N	N	N	N	N	N	N	Y	Y
CA-14 Herpetological Monitoring and Management	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CA-15 Listed Plant Management	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
CA-16 Habitat Restoration Program	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N
CA-17 Invasive Plant and Animal Control	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y

Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation												
Covered Species:	**SNPL**		**CLTE**		**SWPT**		**CRLF**		**WSF**		**Tidewater Goby**	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-18 WHPP Implementation	Y	N	Y	N	N	N	N	N	N	N	N	N
CA-19 Water Quality Monitoring Projects	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Park Maintenance												
CA-20 Campground Maintenance	N	N	N	N	Y	N	Y	N	Y	N	N	N
CA-21 General Facilities Maintenance	Y	Y	Y	Y	Y	N	Y	N	Y	N	N	N
CA-22 Trash Control	Y	Y	Y	Y	N	N	N	N	N	N	N	N
CA-23 Wind Fencing	Y	N	Y	N	N	N	N	N	N	N	N	N
CA-24 Sand Ramp and Other Vehicular Access Maintenance	Y	N	Y	N	N	N	N	N	N	N	N	N
CA-25 Street Sweeping	N	N	N	N	N	N	N	N	N	N	N	N
CA-26 Routine Riparian Maintenance	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
CA-27 Perimeter and Vegetation Island Fencing	Y	N	Y	N	N	N	N	N	Y	Y	N	N

Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation												
Covered Species:	**SNPL**		**CLTE**		**SWPT**		**CRLF**		**WSF**		**Tidewater Goby**	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-28 Cable Fence Maintenance and Replacement	Y	N	N	N	N	N	N	N	N	N	N	N
CA-29 Heavy Equipment Response	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
CA-30 Minor Grading	Y	N	Y	N	N	N	N	N	Y	Y	Y	N
CA-31 Boardwalk and Other Pedestrian Access Maintenance	Y	N	Y	N	Y	N	Y	N	Y	N	N	N
Visitor Services												
CA-32 Ranger, Lifeguard, and Park Aide Patrols	Y	Y	Y	Y	N	N	N	N	N	N	Y	N
CA-33 Emergency Response	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CA-34 Access by Non-CDPR Vehicles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CA-35 ASI Courses (ATV and RUV)	N	N	N	N	N	N	N	N	N	N	N	N
CA-36 Beach Concessions	Y	Y	Y	Y	N	N	N	N	N	N	N	N
CA-37 Pismo State Beach Golf Course Operations	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N

Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation												
Covered Species:	**SNPL**		**CLTE**		**SWPT**		**CRLF**		**WSF**		**Tidewater Goby**	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-38 Grover Beach Lodge and Conference Center	N	N	N	N	N	N	N	N	N	N	N	N
CA-39 Natural History and Interpretation Programs	N	N	Y	N	N	N	N	N	N	N	N	N
Other HCP Covered Activities												
CA-40 Motorized Vehicle Crossing of Creeks	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CA-41 Pismo Creek Estuary Seasonal (Floating) Bridge	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	Y
CA-42 Limited Trail Riding Area	N	N	Y	Y	N	N	N	N	Y	Y	N	N
CA-43 Replacement of the Safety and Education Center	Y	N	Y	N	N	N	N	N	N	N	N	N
CA-44 Dust Control Activities	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	N
CA-45 Cultural Resources Management	Y	N	Y	N	Y	N	Y	N	Y	N	N	N
CA-46 CDPR Management of Agricultural Lands	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N
CA-47 Maintenance of a Bioreactor on Agricultural Lands	N	N	N	N	N	N	Y	Y	N	N	N	N

Table 4-14. Potential for Incidental Take without AMMs and with AMM Implementation

Covered Species:	SNPL		CLTE		SWPT		CRLF		WSF		Tidewater Goby	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-48 Oso Flaco Lake Boardwalk Replacement	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
CA-49 Special Projects	Y	Y	Y	Y	Y	N	Y	N	Y	N	N	N
CA-50 Reduction of the Boneyard and 6 Exclosures	Y	Y	Y	Y	N	N	N	N	N	N	N	N
CA-51 Use of Pesticides	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
CA-52 CDPR UAS Use for Park Activities	Y	Y	Y	Y	N	N	N	N	N	N	N	N

[1]N/A is entered where impacts will be authorized by a Recovery Permit. See Appendix C.

4.10 Listed Plants

4.10.1 Methods to Assess Effects of Covered Activities on Listed Plants

FESA does not prohibit take of listed plant species; however, section 7 of FESA requires that issuance of an ITP must not jeopardize any listed species, including plants. In addition, CDPR is committed to its policy of avoidance and minimization of take of listed species, including loss or other harm to listed plant species. CDPR has included six listed plant species in this HCP in order to evaluate the impacts of the HCP on these listed plant species. For the six listed plant species, maximum allowable temporary and permanent impacts on modeled habitat acreages (Map 18) were identified (Table 4-15). The impact analysis was conducted by intersecting a GIS overlay of covered activities with the modeled habitat of each species.

In addition to the impacts to listed plant species habitat, impacts to individual known plant occurrences were evaluated. Potential direct effects on listed plants were analyzed based on occurrence data in the CNDDB and CDPR records, as well as by mapping covered activities in relation to Potential listed plant species habitat.

4.10.2 Direct and Indirect Effects

Existing and new covered activities that can affect listed plants occur within 1,362 acres of suitable listed plant habitat. Of this area, 550 acres occur in areas where motorized vehicles are allowed, and 812 acres are open to pedestrians and/or CDPR staff only. Covered activities that occur within listed plant habitat are considered to have minor and temporary effects on suitable habitat for listed plants, though impacts to listed plants can still occur (section 4.10.2.5.7). Some existing covered activities, including habitat management and water quality monitoring projects, ultimately benefit listed plants and their habitat by improving and adding suitable habitat for listed plants. In addition, CDPR will actively participate in experimental planting and recovery of listed plants, which is expected to result in additional listed plant species in the HCP area.

Avoidance and minimization of loss of or other harm to listed species will continue to be the primary goal of CDPR. Still, effects of existing and new covered activities on listed plant species and potential listed plant habitat in the HCP area are possible and are described in the following sections. Activities occurring outside of listed plant species habitat (Map 18) do not affect the listed plants unless specifically discussed in the following sections. Table 4-15 in section 4.10.2.5.7 summarizes the potential effects and potential take of listed plant species from covered activities. AMMs that address the effects are provided in section 5.3.1.

4.10.2.1 Park Visitor Activities

4.10.2.1.1 Motorized Recreation (CA-1)

Impacts on listed plants due to motorized recreation in the past have been difficult to assess and have not been documented in the open riding area. In general, areas open to motorized recreation (and areas where most non-designated camping occurs) almost entirely consist of bare sand and do not contain listed plant species. Although unlikely, some listed plant species could occur within sand dune areas and/or areas with sparse vegetation open to motorized recreation and may go undetected. However, no listed plant species have been detected in areas open to motorized recreation since 2003 when surf thistle and beach spectaclepod were discovered in a revegetation area in the foredunes of the open riding area between beach Posts 7 and 8 (Gardner, L., pers. comm. 2003). If listed plant species occur in the areas where motorized recreation is allowed, these activities can crush or destroy listed plant

species individuals. Motorized recreation is considered to have a minimal direct effect on listed plant individuals to date due to lack of occurrences and suitable habitat in those areas and this is expected to continue in the future.

In the past, indirect impacts to listed plants due to motorized recreation have been difficult to assess and have not been documented in the open riding area. Listed plant species, including La Graciosa thistle, beach spectaclepod, and surf thistle, have previously been observed in the vegetation islands in the open riding area. Direct impacts to listed plants in the vegetation islands are not known to occur since these areas are fenced off and motorized recreation is prohibited from entering these areas. However, motorized vehicles adjacent to vegetation islands can destabilize substrates in the HCP area and, ultimately, result in increased erosion, especially during wind events. This destabilized material can coat vegetation and interfere with normal gas exchange, photosynthesis, or pollination. In addition, motor vehicles are known to inadvertently spread invasive plants (e.g., on tires) by moving seeds or plant segments if they move from one place with invasive species to a less impacted area. As a result, motorized recreation is considered to have a minimal effect on listed plant individuals adjacent to motorized activities.

Motorized vehicle recreation degrades or modifies potentially suitable habitat for listed plant species, including surf thistle and beach spectaclepod, that would otherwise occur in sparsely vegetated or coastal dune habitat and prevents these species from establishing within the foredunes. As a result, motorized recreation has likely kept some listed plants from growing in the open riding area. Section 4.11.3 describes impacts to La Graciosa thistle critical habitat.

4.10.2.1.2 Pedestrian Activities (CA-3)

Beach spectaclepod, surf thistle, and La Graciosa thistle have the potential to occur in the vegetation islands and in other areas open to pedestrians near Oso Flaco Lake and South Oso Flaco (Map 20, Map 21, and Map 22). The vegetation islands and the vegetation surrounding Oso Flaco Lake are fenced to protect the fragile dune ecosystem from OHVs, but access by pedestrians is allowed, unless posted as closed. Therefore, pedestrians walking through vegetation islands and the vegetation surrounding Oso Flaco Lake and South Oso Flaco can trample beach spectaclepod, surf thistle, and La Graciosa thistle individuals and disturb their habitat. Pedestrians can also facilitate the spread of invasive species, which could outcompete listed plant species. Potential impacts to listed plants from visitor activities may be exacerbated during periods of high visitor use, such as holidays (e.g., July 4). However, fencing is installed around vegetation islands, which often deters pedestrians from entering. In addition, vegetation in many of these areas is dense and pedestrians typically do not walk through vegetated areas. In addition, if listed plant populations are found where pedestrian use is heavy, fencing and educational signage will continue to be utilized to protect listed species. Informal trails entering listed plant habitats will also continue to be closed and restored to pre-trail conditions to avoid negative impacts on listed plant species from pedestrians. As a result, the impact to listed plant species from pedestrian activities is considered minimal. Section 4.11.3 describes impacts to La Graciosa thistle critical habitat.

4.10.2.1.3 Fishing (CA-5)

Fishing is allowed within the HCP area year-round. Shore fishing within the ocean does not impact listed plant species since these activities occur on the wet sand, subject to tidal flows and/or the ocean where no suitable habitat for listed plant species is present. Fishing, including in non-motorized boats, can occur within Oso Flaco Lake where listed plant species, including marsh sandwort, La Graciosa thistle, and Gambel's watercress are known to or have potential to occur. Impacts on listed plants from fishing and boating in Oso Flaco Lake are not known. In general, people fishing along the lake shoreline and/or launching boats from the lake shoreline could trample listed plant individuals in these areas. In addition,

people and boats could inadvertently facilitate the spread of invasive species (e.g., on shoes, clothing, or boats) by moving seeds or plant segments if they move from one place with invasive plants to a less impacted area. Invasive species could outcompete special-status plant species. Fish consumption advisories are posted at Oso Flaco Lake due to high levels of pesticides. As a result, fishing in Oso Flaco Lake is not a regular activity. In addition, known listed plant populations are flagged and/or fenced to prevent impacts. As a result, effects on listed plants resulting from fishing are considered minimal, and this is expected to remain the same in the future.

4.10.2.1.4 Equestrian Recreation (CA-7)

Impacts to special-status plants due to equestrian recreation have been difficult to assess in the past, and they have not been documented in the HCP area. Equestrians use the beaches and trails in the HCP area, including the Dunes Preserve. Equestrians traveling through the Dunes Preserve disturb designated La Graciosa thistle critical habitat (section 4.11.3; Map 20) and other suitable La Graciosa thistle habitat (Map 18) in the HCP area. However, to date, equestrians traveling through these areas have typically stayed on sandy trails and have rarely traveled off-trail, and this is expected to remain the same in the future. As a result, effects from equestrians considered minor and temporary in nature. Section 4.11.3 describes impacts to La Graciosa thistle critical habitat.

4.10.2.1.5 Boating/Surfing (CA-8)

Impacts from boating can occur in Oso Flaco Lake, as described above for fishing in section 4.10.2.1.3.

4.10.2.2 Natural Resources Management Program

4.10.2.2.1 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

The Oceano Dunes District manages and restores vegetation in areas occupied or potentially occupied by listed plant species to benefit these and other native species. These management measures include monitoring and enhancing habitat for listed plant species populations, including removing invasive species and monitoring the response of the listed plant species to habitat restoration. In addition, CDPR plans to propagate and conduct experimental outplanting of listed plant species in the future.

Monitoring and habitat enhancement activities provide a net benefit for the listed plant species; however, some listed plant individuals could be affected during these activities. A listed plant could be inadvertently missed during monitoring and pre-restoration surveys and could be stepped on by field survey crews or work crews. To reduce these impacts, CDPR conducts annual surveys for listed plant species. In addition, biologists limit the amount of time they spend in occupied habitat to reduce the risk of trampling a listed plant species. As a result, effects from these activities are considered minimal.

Prescribed fire is used infrequently to manage invasive plant species in the foredunes and can present a threat to La Graciosa thistle, beach spectaclepod, and surf thistle. Areas occupied by marsh sandwort, Gambel's watercress, and Nipomo Mesa lupine do not receive prescribed fire treatments and, therefore, are not be affected by prescribed fire activities. While conducting prescribed fire activities, La Graciosa thistle, beach spectaclepod, and surf thistle could be damaged or burned, despite best efforts to exclude the fire from the occupied listed plant habitat. To reduce these impacts, CDPR marks listed plant species and establishes a fire line of mineral soils around known populations, and a trained botanist remains on site during all fire activities. In addition, heavy equipment, including fire engines, are required to stay out of sensitive habitat, and locations for the placement and staging of heavy equipment are clearly marked on a map. As a result, effects from fire treatments are considered minimal.

Propagating listed species will require collecting seed or plant materials and cultivating the species in the greenhouse, and ultimately transplanting individuals into suitable habitat. These activities will provide a net benefit for the listed plant species; however, some listed plant individuals could be

affected during these activities. A plant could be inadvertently missed while gathering materials for propagation, and propagated individuals could be damaged or destroyed in the greenhouse or during transplanting. To minimize any impacts that could occur during experimental propagation and outplanting, CDPR will coordinate with the Wildlife Agencies and all work will be conducted in accordance with federal and state regulations protecting listed plant species.

Overall, monitoring, propagation, experimental outplanting, and habitat enhancement activities provide a net benefit for the listed plants and other native plant species by removing invasive weedy species, thereby reducing competition from these species for space, light, water, and nutrients. Experimental propagation and outplanting also benefit listed plant species by contributing to the recovery of listed plant species.

4.10.2.2.2 Habitat Restoration Program (CA-16)

Yearly vegetation planting is considered to have low potential to directly or indirectly affect listed plant species because vegetation projects typically occur in areas with bare sand that do not support listed plant species or in areas, including previously restored sites, that are not known to contain listed plant species. If listed plant individuals are present, they could be trampled during vegetation planting activities, but vegetation is primarily planted adjacent to existing vegetated areas, including vegetation islands, and is not planted immediately in areas that could be occupied by listed plants. The risk of damaging existing listed plant populations thus is low. Vegetation projects are also designed to match the existing plant community composition in the area to ensure that additional species planted are compatible with listed plant species and that any additional species will not outcompete existing listed plant species. In addition, plant materials from local genetic stock are used to minimize the chance of introducing plants not adapted to local conditions.

Dune slack restoration at Jack and Surprise lakes will incorporate transitional banks and swales that provide La Graciosa thistle habitat. Restoration activities, however, including site access, equipment staging, excavation, and sediment/substrate spreading, could occur within or adjacent to current habitat for La Graciosa thistle and Nipomo Mesa lupine. AMMs including pre-activity surveys, avoidance, and salvage and relocation will be implemented. As a result, adverse effects from habitation restoration are considered minimal, with restoration ultimately benefitting La Graciosa thistle and potentially marsh sandwort.

Seed collection for restoration can occur in areas within or near listed plant habitat. Therefore, listed plant species can be inadvertently trampled while collecting seeds. However, seed collection is conducted by experienced Natural Resource staff and/or botanists who know the location of the listed plant species. As a result, effects from seed collection are considered minimal.

4.10.2.2.3 Invasive Plant and Animal Control (CA-17)

Effects on listed plant species from invasive plant and animal control (not specifically targeted at benefitting listed plant species) will be similar to those described in sections 4.10.2.2.1 and 4.10.2.5.7 for listed plant monitoring, propagation, and habitat enhancement. The greatest threats during these activities are trampling, inadvertent spraying, and physical disruption to listed plants while manually removing invasive vegetation. Pre-project surveys, buffer zones, and hand pulling methods will continue to be utilized to avoid any unnecessary impacts. In addition, a qualified biologist/Natural Resource staff will be present at all phases of the work and will be responsible for work crew education; conduct regular inspection of marked populations of listed species to ensure that they remain marked and clearly visible to work crews; and monitor work crews to ensure that they are observing the precautions and prohibitions regarding avoiding damage to listed plant species. They will also have the authority and

responsibility of stopping work if unanticipated damage to listed species is occurring. As a result, impacts from invasive plant and animal control will continue to be minimal.

4.10.2.3 Park Maintenance

4.10.2.3.1 General Facilities Maintenance (CA-21)

CDPR will be using a tractor-towed rake or similar device to collect nails, broken glass, and other debris that may pose a hazard to visitors or wildlife from high use. Mechanical trash removal will only occur above the wrack line in the Grand Avenue and Pier Avenue entrance areas, the Post 2 trash dumpster areas, Post 2 south to Post 4.5 and the open area to Post 6 (which is east of the 48-acre foredune area). Mechanical trash removal will not occur within vegetated areas, or within any fenced closed areas where SNPL and CLTE nesting occurs, or near any lagoon or creek.

Although unlikely, some listed plant species could occur within sand dune areas and/or areas with sparse vegetation north of Post 6 including surf thistle, La Graciosa thistle, and beach spectaclepod. If listed plant species were to occur in the areas where mechanical trash removal is allowed, these activities could crush or destroy listed plant individuals. However, mechanical trash removal is conducted to remove litter in areas where recreation activities have been concentrated and the substrate is already highly disturbed. These areas are unlikely to support listed plants due to the high level of recreation. As a result, impacts from mechanical trash removal would be minimal.

4.10.2.3.2 Routine Riparian Maintenance (CA-26)

The Oceano Dunes District protects riparian habitat by maintaining roads, culverts, spillways, trees and shrubs, and controlling emergent species and invasive species populations within riparian corridors in the HCP area. Routine riparian maintenance has not resulted in the loss of listed plant species to date. Listed plants, including marsh sandwort, Gambel's watercress, La Graciosa thistle, and beach spectaclepod are, however, known to occur at some or all of the routine riparian maintenance locations. Therefore, riparian maintenance has the potential to directly impact listed plant species if they occur in an area designated for maintenance activities. However, CDPR implements AMMs as a part of conducting riparian maintenance, including in accordance with their existing Lake and Streambed Alteration Agreement from the CDFW. These AMMs include conducting pre-activity surveys annually prior to commencing activities, flagging the area that supports the species, and avoiding flagged areas (section 5.3). As a result, these effects are considered minimal.

To date, marsh sandwort and/or Gambel's watercress have not been observed within the Oso Flaco Lake culvert. However, the possibility exists that either marsh sandwort or Gambel's watercress could be attached to plants or root balls that are clogging the culvert. Should this happen, it will require the plant to be removed from the culvert. Every effort will be made to identify listed plants before removal of vegetation in the culvert occurs to allow the opportunity to salvage the plant by moving it to another location. Although marsh sandwort or Gambel's watercress will be salvaged if possible, some individuals could be destroyed. Any removal or salvage of Gambel's watercress or marsh sandwort would require consultation with the USFWS and/or CDFW prior to implementation. In addition, any listed plant left in the culvert will likely be damaged because of high flows. As a result, any Gambel's watercress or marsh sandwort individuals that are blocking the culvert will be lost regardless of maintenance activities. Although marsh sandwort or Gambel's watercress will be salvaged if possible, some individuals could be lost.

4.10.2.3.3 Heavy Equipment Response (CA-29)

Heavy equipment response does not occur within open water habitat; therefore, Gambel's watercress and marsh sandwort are not impacted. Beach spectaclepod or surf thistle can be directly harmed during

a heavy equipment response in occupied habitat in the HCP area (e.g., near the Oso Flaco boardwalk). These plants can be driven over or crushed by vehicles or attendant personnel and habitat can be temporarily damaged. To reduce any impacts from heavy equipment response, CDPR will continue to implement AMMs as a component of utilizing heavy equipment, including conducting pre-activity surveys, as determined to be necessary by a qualified biologist/Natural Resource staff, and flagging areas that support plant species (section 5.3). In addition, heavy equipment response operations are extremely rare in areas where listed plants occur; thus, the effect of these operations on listed plants is considered minimal.

4.10.2.3.4 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Boardwalk and other pedestrian access maintenance occur within the HCP area once a year. Special-status plant species are not typically located directly adjacent to these areas. However, if any listed plant species occupy habitat requiring clearing for pedestrian access purposes, they could potentially be damaged and/or removed or trampling by field crews. However, most work only includes trimming vegetation encroaching on footpaths with hand tools; therefore, listed plants are unlikely to be impacted since they would not be expected to be encroaching on the boardwalks or trails. In addition, any damage to habitat is expected to be minor and temporary as a result of foot traffic in the area. In addition, these impacts will continue to be avoided through the implementation of AMMs (section 5.3). Specifically, CDPR will continue to conduct pre-activity surveys and flagging areas that support listed plant species; thus, the potential effect of these operations on listed plants will continue to be minimal.

Demolition and installation of a replacement boardwalk in upland habitats has potential to directly and indirectly affect listed plant species. Project activities such as grading and excavation activities could have both direct and indirect impacts on listed plants that might occur within the project area. Project activities may affect these plants through direct disturbance of vegetation, modification or destruction of habitat, or through damage to underground root structures. Equipment use, soil disturbance, and worker foot traffic may result in the injury or mortality of individual listed plants. Excavation and grading activities may result in the mechanical or physical removal of vegetation and modification of the seed bank due to grading or disturbance. To minimize these impacts, prior to any replacement activities, botanical surveys will be conducted in the area, and any listed plants will be flagged and protected from disturbance. Effects on listed species from upland boardwalk replacement will be minimal.

Project activities may also cause an increase in invasive plant cover. Invasive plants degrade habitat quality for native plants and animals by altering vegetative structure and/or outcompeting native plants. However, CDPR actively removes invasive plants from the HCP area as part of the invasive plant and animal control activity (CA-17). As a result, indirect impacts to listed plants from boardwalk replacement will be minimal.

4.10.2.4 Visitor Services

4.10.2.4.1 Emergency Response (CA-33)

Emergency response activities by nature require a quick response for public safety; therefore, protection of natural resources may not be possible during an emergency response. Effects on listed plant species from emergency response activities is considered to be similar to those listed under Heavy Equipment Response (section 4.10.2.3.3) except that implementing protection measures may not be possible and emergency response, although extremely rare, can occur within aquatic habitats and impact aquatic special-status plant species such as marsh sandwort and Gambel's watercress. Within the HCP area, emergency responses are extremely rare where listed plants occur, and destruction of sensitive habitat has not been documented to date. As a result, the potential effect of these activities on listed plants is considered minimal.

4.10.2.5 Other HCP Covered Activities

4.10.2.5.1 Pismo Creek Estuary and Seasonal (Floating) Bridge (CA-41)

The District has proposed installing a seasonal, floating pedestrian bridge across Pismo Creek estuary to provide pedestrian access from the Pismo Coast RV Resort to Pismo State Beach. Installing the bridge should reduce the pedestrian impact on Pismo Creek by reducing erosion and providing an alternative to walking through the mouth of the creek for pedestrians wishing to walk up coast. Listed plant species are not known to occur at the Pismo Creek estuary bridge location; however, suitable habitat is present for some listed plant species, including La Graciosa thistle, beach spectaclepod, and surf thistle. As a result, overall impacts to listed plants in the area and their habitat would be beneficial since the bridge would prevent existing trampling of vegetation by pedestrians and protect any listed plant species that may be present.

Although unlikely, beach spectaclepod, surf thistle, and La Graciosa thistle have the potential to occur along Pismo Creek estuary. Equipment use and worker foot traffic during construction of the bridge could result in the injury or mortality of individual listed plants if they are present in the work area. Construction activities could also result in mechanical or physical removal of vegetation and modification of the seed bank due to grading and/or excavation. Finally, construction activities and/or pedestrian traffic across the bridge once it is operational could introduce invasive weeds to the area, which could outcompete listed plant species. However, CDPR would conduct a survey for special-status plant species prior to the start of construction during the appropriate phenological period, if determined to be necessary by a qualified biologist/Natural Resource staff. Any special-status plant species found would be flagged and/or fenced off and avoided during construction. In addition, best management practices to minimize to prevent accidental spills and erosion will be employed during all construction activities. CDPR will also continue to provide educational content to workers and pedestrians in the area, which includes information on what they can do to prevent introducing invasive species. With implementation of these measures, impact on special-status plants would be minimal.

4.10.2.5.2 Limited Trail Riding Area (CA-42)

Potentially suitable habitat for listed plant species could occur within the limited trail riding site (Map 8), though this area has not been recently surveyed for occurrences of listed plant species and listed plants were not planted there. If the Oceano Dunes District pursues the option of opening the site to motor vehicle recreation, planning will include surveys for listed plant species within all areas under consideration for vehicular recreation to ensure impacts to listed plants are minimized. In addition, trails and other areas open to vehicles will be sited with adequate buffers from any occurrences of listed plants found in the site (section 2.2.5.3). Listed plant occurrences found in the limited trail riding site will also be fenced to protect populations from trampling by park visitors. As a result, these effects will be minimal.

An increase in use of adjacent, open habitat could increase wind-blown sand that eventually covers listed plant populations adjacent to the trail. The amount of wind-blown sand that will result from opening parts of the site to limited trail riding is unknown at this point and will depend on how much scrub is removed.

4.10.2.5.3 Dust Control Activities (CA-44)

Dust control measures that have been implemented included surveys for listed plant species and avoidance of any listed plants observed; no listed plants were known to be impacted. The location of future backdune acreage to be planted for dust control or used for wind fencing is not determined but could overlap with suitable habitat for listed plant species. Direct effects on listed plant species could

include trampling or removal during work activities. Indirect effects could include habitat alteration (i.e., changing species composition as a result of altered wind, sand transport, moisture content, etc.). In general, dust control activities occur in open sand between vegetation patches. The potential magnitude of impacts on listed plants will continue to be lowest when dust control activities take place in open sand habitat because these areas support little to no dune vegetation or habitat for listed plant species. As program activities approach the edge of vegetation islands and other vegetated areas, the potential to impact listed plants and their habitat will increase. However, dust control project requirements include AMMs (section 5.3), such as pre-work surveys for all listed plants, flagging and protection for all listed plants, establishment of 25-foot avoidance areas around all listed plants, and restoration of disturbed habitat to avoid impacts to listed plant species. In addition, planting native vegetation within the HCP area will likely create new suitable habitat for listed plant species. Therefore, impacts to listed plants as a result of dust control activities will continue to be minimal and may be beneficial.

4.10.2.5.4 Cultural Resources Management (CA-45)

Cultural resources management currently occurs in terrestrial habitats in the HCP area and is not known to have impacted special-status plants to date. However, should a cultural resource site be located in an area occupied by listed plants, testing, data recovery, stabilization, or restoration of the site could directly impact listed plant habitat and result in loss of individuals. To minimize the potential to impact listed plants, prior to the start of any cultural resources management activities in listed plant species' habitat, a biologist with experience in identifying the listed species will conduct surveys for listed plant species throughout the affected area. Any plant encountered will be marked on a map, flagged or fenced, and avoided to the maximum extent possible. Therefore, effects on listed plant species will continue to be minimal.

4.10.2.5.5 Oso Flaco Lake Boardwalk Replacement (CA-48)

Deconstruction and installation of a replacement boardwalk have potential to directly and indirectly affect listed plant species. Project activities such as dredging, pile driving, and dewatering activities could have both direct and indirect impacts on listed plants that might occur within the project area. Project activities may affect these plants through direct disturbance of vegetation, modification or destruction of habitat, or through damage to underground root structures. Equipment use and worker foot traffic may result in the injury or mortality of individual listed plants. Excavation activities may result in the mechanical or physical removal of vegetation and modification of the seed bank due to grading or disturbance. To minimize these impacts, prior to any replacement activities, botanical surveys will be conducted in the area and any listed plants will be flagged and protected from disturbance. Effects on listed species from boardwalk replacement will be minimal.

Project activities in water may also affect listed plants indirectly through temporary increases in turbidity and decreases in water quality from dredging, pile driving, as well as from temporary fills such as cofferdams or access ramps. Project activities may also cause an increase in invasive plant cover. Invasive plants degrade habitat quality for native plants and animals by altering vegetative structure and/or outcompeting native plants. However, CDPR actively removes invasive plants from the HCP area as part of the invasive plant and animal control activity (CA-17). In addition, any increases in turbidity or decreases in water quality would be temporary and relatively short in duration lasting only during any work within open water. As a result, indirect impacts to listed plants from boardwalk replacement will be minimal.

4.10.2.5.6 Special Projects (CA-49)

Installation, operation, and maintenance of new facilities have potential to directly or indirectly affect listed plant species. Facilities could be installed on open sand, near vegetation islands, and/or

backdunes. Equipment use and worker foot traffic during construction of the special project could result in the injury or mortality of individual listed plants. Construction activities could also result in mechanical or physical removal of vegetation and modification of the seed bank due to grading and/or excavation. Finally, construction activities could introduce invasive weeds to the area, which could outcompete listed plant species. The Oceano Dunes District, however, has some flexibility to install these facilities in locations and in a manner that avoids negatively impacting listed plant species. In addition, to minimize the potential impacts to listed plants, prior to the start of any special project installation in listed plant species habitat, a biologist with experience in identifying the listed species will conduct surveys for listed plant species throughout the proposed special project area. Any listed plant encountered will be marked on a map, flagged, or fenced, and avoided. Therefore, effects on listed plant species will be minimal.

Special projects may also result in the permanent loss of up to 35 acres of La Graciosa thistle, beach spectaclepod, and/or surf thistle habitat (Table 4-15), although CDPR has some flexibility to install special project facilities in locations and in a manner that avoids negatively impacting native vegetation communities and/or special-status plant habitat.

4.10.2.5.7 Use of Pesticides (CA-51)

The use of herbicides and surfactants could kill an individual of a listed plant species if applied in sensitive habitat. The potential impact of each pesticide used in the HCP area follows.

Glyphosate has been used to control invasive plants since the 1970s. Glyphosate is metabolized by some, but not all plants. Foliar exposures to glyphosate are much more toxic than soil exposures. The lesser toxicity of glyphosate in soil exposure is probably attributable, at least in part, to the tight binding of glyphosate to some types of soils (SERA 2011a). EPA completed a biological evaluation for glyphosate and determined glyphosate is likely to adversely affect La Graciosa thistle and Nipomo Mesa lupine (EPA 2021a). Future consultation between EPA and USFWS may result in additional mitigation measures for glyphosate use (EPA 2021b), which may or may not be applicable to the HCP area.

Imazapyr (Habitat®) kills a wide variety of plants and can be relatively persistent. The most sensitive species appear to be aquatic macrophytes, and aquatic algae appear to be much less sensitive. Some species of plants, develop resistance to imazapyr (Washington Department of Agriculture 2017).

Fluazifop-P-butyl kills annual and perennial grasses but is not known to harm broad-leaved plants (i.e., dicots).

Triclopyr is a dicot-specific herbicide (White 2007).

Aminocyclopyrachlor is an auxin-mimicking herbicide that interferes with normal plant growth.[80] It affects actively growing tissue rather than mature tissue. It is more effective on dicots (e.g., broadleaved plants) (EPA and Office of Pesticide Programs 2010) than monocots (e.g., grasses; (SERA 2012)).

Chlorsulfuron is recommended for pre-emergent and early post-emergent control of annual, biennial, and perennial broadleaf weeds. It can affect some non-target plants, including both terrestrial and aquatic plants. Chlorosulfuron inhibits acetolactate synthase (ALS), which is an enzyme that is essential for plant growth. As a result, at certain doses, chlorsulfuron can inhibit growth of non-target plants (SERA 2004).

[80] Auxin is a hormone that regulates plant growth.

Dicots are substantially more sensitive to aminopyralid than monocots (EPA 2005, DOW Chemical Company AgroSciences 2008).

Clethodim is used for the control of grassy weeds and only affects grass species. There is no indication that clethodim adversely affects dicots (SERA 2014).

Sethoxydim kills grasses and has little to no impact on broadleaf herbs or woody plants (SERA 2001).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® and Renegade EA® on non-target plants. The product safety data sheets for these surfactants state that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Overall, the intent of herbicide use is to eliminate invasive weeds within the HCP area. Invasive and non-native weeds are a known threat to native plant populations since they can outcompete native plant species. Based on years of survey data for covered species and implementation of specific AMMs for herbicide use (Chapter 5), herbicide use for invasive plant removal within the HCP area results in an overall beneficial effect to these species and La Graciosa thistle critical habitat by reducing the number of invasive and non-native species.

Contamination of special-status plants from herbicides could result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. However, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide/herbicide exposure and associated risks to listed plant species are expected to decrease with increasing distance from the treated field or site of application. CDPR does not apply herbicides during inclement weather to reduce impacts from drift on non-target vegetation. The application of herbicides is also conducted by trained applicators accompanied by a qualified botanist/Natural Resource staff. CDPR also takes extra precautions applying herbicides near open water and wetlands and other sensitive habitats that support listed species. AMMs listed in Chapter 5 are considered to reduce or eliminate any impacts.

4.10.3 Anticipated Impacts on Listed Plant Species

As stated previously, there are no federal prohibitions under the FESA for the take of listed plants on non-federal lands, unless taking of those plants is in violation of state law. However, before the USFWS issues a permit, the effects of the permit on listed plants must be analyzed because section 7 of FESA requires that issuance of an ITP must not jeopardize any listed species, including plants. Maintaining consistency with section 7(a)(2) of FESA, section 10 prohibits the issuance of an ITP that will appreciably reduce the likelihood of the survival and recovery in the wild (i.e., “jeopardize”) of any endangered or threatened species, including plants. Although not specifically addressed by section 10, listed plants can be covered by HCPs under the USFWS’s “No Surprise” assurance rule, discussed in section 6.5.2.

Based on the locations of listed plant occurrences, numerous covered activities, including pedestrian activities, the natural resources management program, park maintenance, and visitor services, have the potential to affect listed plants as discussed in section 4.10.2. Numerous measures to avoid and minimize impacts to listed plants for these covered activities will continue to be implemented throughout the permit term (section 5.3) and theses are expected to minimize any impacts. However, this HCP anticipates that a small amount of impacts to each listed plant species to maintain vital infrastructure (e.g., routine riparian maintenance and culvert cleanout) and to enhance habitat for the

plant species is unavoidable. The impact limits for each listed plant species are discussed in the following sections. Impacts to listed plant species habitat are provided in Table 4-15.

4.10.3.1 Anticipated Impacts on Marsh Sandwort and Gambel's Watercress

One occurrence of marsh sandwort consisting of two colonies persists at Oso Flaco Lake, both within the HCP. Also, one occurrence of Gambel's watercress consisting of two small colonies persists at Oso Flaco Lake, one within the HCP and one on private property. In 2020 and 2022, the two colonies of marsh sandwort and the two colonies of Gambel's watercress persisted, however, the number of individuals was not quantified due to limited visibility within the habitat structure that supports the spindly growth of both species. During the most recent survey in 2022, at least 150 individual stems of marsh sandwort and approximately 10 stems of Gambel's watercress were observed above the supporting habitat structure. Covered activities that may impact these species include riparian maintenance and activities that will assist with the recovery of these species.

Individual marsh sandwort and Gambel's watercress could be impacted if they occur within culverts and other areas where cleaning and vegetation removal is necessary to maintain the integrity of infrastructure. Individuals could be translocated to suitable habitat within the same watershed if riparian maintenance and culvert cleanout activities cannot avoid impacts to these species. Translocated individuals will not be counted as impacted if monitoring indicates that each individual has survived at least 2 years after translocation.

Marsh sandwort and Gambel's watercress could also be impacted by activities implemented to enhance and restore habitat and assist with the recovery of these species in the HCP area, as discussed in section 2.2.2.1. These enhancement and restoration activities include monitoring listed plant populations and clearing native and non-native vegetation from occupied habitat. Small numbers of individuals could be lost during implementation of these activities. Overall, enhancement and restoration activities will have a net benefit on these species by removing competitive, invasive species and restoring and enhancing habitat. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population. Impacts to these plants that could occur during monitoring and enhancement/restoration activities will not contribute to the impact limit.

AMMs will ensure that riparian maintenance and habitat enhancement/restoration activities will continue to avoid or minimize impacts to occurrences of these plant species in the HCP area; however, complete impact prevention may be unavoidable. Due to the extremely limited populations of marsh sandwort and Gambel's watercress in the HCP area, it is anticipated that no more than 15 individuals of each species will be impacted over the permit term. Individuals that cannot be avoided will be translocated, as feasible, to suitable habitat nearby. In addition, up to 500 square feet of habitat for marsh sandwort and Gambel's watercress could be impacted by riparian maintenance activities associated with culvert cleanout.

4.10.3.2 Anticipated Impacts on La Graciosa Thistle

In recent years, La Graciosa thistle numbers have declined in the HCP area, potentially due to encroaching vegetation. Only 15 individuals were found in 2019 with increases in 2020 and 2021 to 17 and 45 individuals respectively. In 2022, only 12 individuals were observed and only 14 in 2023. Covered activities that may impact this species include management activities undertaken to protect, restore, and recover populations in the HCP area, including weed control (i.e., prescribed fire and herbicide), propagation, and habitat enhancement and restoration. Management activities implemented to protect, restore, and recover populations in the HCP area will have a net benefit on this species by removing competitive non-native species and otherwise enhancing habitat. AMMs will continue to be implemented to minimize impacts of plant propagation, weed control, and habitat enhancement

activities on this plant species; however, complete impact prevention may be unavoidable, and small numbers may be lost during implementation of these activities. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population. Impacts to La Graciosa thistle are expected to be no more than 25 individuals over the permit term, with no more than one in any calendar year. In addition, up to 549 acres of temporary impacts could occur to La Graciosa thistle habitat from these activities and construction of special projects, and up to 35 acres of permanent impact could occur to La Graciosa thistle habitat from special projects.

4.10.3.3 Anticipated Impacts on Nipomo Mesa Lupine

The population of Nipomo Mesa lupine is scattered across a 2-mile stretch of backdune. A full census of the population was conducted annually between 2007 and 2017. During that time the population reached a high of 1,677 individuals in 2013 and a low of 139 individuals in 2008. Within the HCP area, CDPR has conducted management activities to improve and maintain suitable habitat for Nipomo Mesa lupine including invasive species removal using herbicide with herbicide free buffers since 2016, manual removal of perennial veldt grass with seasonal restrictions since 2019 and protective caging of Nipomo Mesa lupine individuals since 2022. In addition, CCBER conducted an outplanting project in the fall of 2022 seeding 10 plots within the HCP area with a total of 5000 seeds. As a result, in 2023 the historical population of Nipomo Mesa lupine within the HCP area increased to its greatest number of 769 since 2007. The CCBER outplanting plots produced an additional 980 individuals in 2023 resulting in a total population of 1,749 individuals within the HCP.

Impacts to Nipomo Mesa lupine are anticipated during habitat enhancement and other management activities, including invasive species management, caging of individuals and monitoring Nipomo Mesa lupine individuals are very small and can grow close together making them susceptible to trampling during management activities. Prescribed fire is only used in the foredunes to remove invasive grass species and will not be used in Nipomo Mesa lupine habitat; however, herbicides are used to remove invasives in the Phillips 66 leasehold, and Nipomo Mesa lupine could be trampled during these activities and/or impacted by spry drift from herbicide treatments. Management activities implemented to protect, restore, and recover populations in the HCP area have a net benefit on this species by removing competitive invasive species, protecting individuals from herbivory and otherwise enhancing habitat. However, small numbers of individuals could be lost during implementation of these actions. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population.

Impacts to Nipomo Mesa lupine are expected to be no more than 200 individuals over the permit term, with no more than 10 per any calendar year. In addition, up to 117 acres of Nipomo Lupine habitat could temporarily impacted during habitat enhancement activities.

4.10.3.4 Anticipated Impacts on Beach Spectaclepod and Surf Thistle

Almost 750 individual beach spectaclepod individuals and over 1,700 surf thistle individuals were counted in 2023 within the HCP area in the South Oso Flaco area. Covered activities that may impact these species include park visitor activities, cultural resources management, and management activities undertaken to protect, restore, and recover populations in the HCP area including weed control, propagation, and habitat enhancement and restoration. Management activities implemented to protect, restore, and recover populations in the HCP area have a net benefit to these species by removing competitive invasive species and otherwise enhancing habitat. However, a small number of individuals could be lost during implementation of these actions. AMMs will continue to minimize impacts to these two listed plant species; however, complete impact prevention may be unavoidable. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population.

No more than 100 individuals each of beach spectaclepod and surf thistle are expected to be impacted over the permit term. In addition, up to 870 acres of temporary impacts could occur to beach spectaclepod and surf thistle habitat from these activities and construction of special projects, and up to 35 acres of permanent impact could occur to beach spectaclepod and surf thistle habitat from special projects.

Table 4-15. Maximum Allowable Permanent and Temporary Impacts to Listed Plant Species Habitat

	Number of Individuals Impacted over the Permit Term	Total Modeled Habitat	Maximum Allowable Temporary Impact to Modeled Habitat from Covered Activities	Percent Temp. Impact to Total Habitat	Maximum Allowable Permanent Impact to Modeled Habitat from Covered Activities	Percent Perm. Impact to Total Habitat
Marsh sandwort	15	11 acres	500 ft^2	<0.01%	0 acres	0%
Gambel's watercress	15	11 acres	500 ft^2	<0.01%	0 acres	0%
La Graciosa thistle	25	549 acres	549 acres	100%	35 acres	0.06%
Nipomo Mesa lupine	200	117 acres	117 acres	100%	0 acres	0%
Beach spectaclepod	100	870 acres	870 acres	100%	35 acres	0.04%
Surf thistle	100	870 acres	870 acres	100%	35 acres	0.04%

4.10.4 Overall Impacts to Listed Plant Species

While take of listed plants is not prohibited under FESA (16 U.S Code 1531 et seq.), the impacts of the covered activities on the listed plants, as species and across their ranges, are identified and mitigated.

4.10.4.1 Marsh Sandwort

Marsh sandwort is extremely rare with one extant historic population, occurring at Oso Flaco Lake, and 7 other introduced occurrences presumed to be extant (CNDDB 2024, USFWS 2020c).

Conservation goals and objectives listed in section 5.2.8 and AMMs listed in section 5.3 endeavor to fulfill several of the recovery objectives for this species. CDPR will continue to monitor and document these species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. The goals and objectives in this HCP protect, maintain, and enhance habitats by protecting water quality, restoring habitat, removing invasive species, and avoiding habitat and occurrences during covered activities.

All known populations of marsh sandwort occur in areas with limited access by the public. Because of their limited distribution, the modification of marsh sandwort or its habitat will not be allowed, except in the case of safety issues (e.g. replacing a failing culvert in suitable habitat). Even then, the habitat disturbance will be temporary in nature, and if any of these species are encountered and could be impacted during culvert replacement, they will be transplanted, if feasible.

Twenty-five marsh sandwort individuals were reported in the HCP area in 2005, and the species was confirmed present in 2022, although the number of individuals was not quantified, the population was estimated to have at least 150 stems above the carex mat substrate they were growing out of. No permanent loss of marsh sandwort habitat will occur under this HCP, and the loss of 15 individuals over the course of the permit term will not substantially affect the marsh sandwort population and distribution on site, especially since individuals that could be impacted will be transplanted, as feasible, and CDPR will continue to monitor transplanted individuals. In addition, CDPR will continue to remove invasive species at Oso Flaco Lake, which will improve habitat for this species. Finally, although this HCP anticipates 15 individuals could be lost, this is a worst-case scenario, and it is likely that only a few (if any) individuals will actually be impacted. Therefore, Oso Flaco Lake will likely continue to be a location for the only extant, wild population of this species.

4.10.4.2 Gambel's Watercress

Four populations of Gambel's watercress are currently known to exist, including two populations on VSFB, one population at Oso Flaco Lake, and one introduced population in the Guadalupe-Nipomo Dunes National Wildlife Refuge, which may not be viable. Genetic studies have indicated that the population at Oso Flaco Lake shows hybridization with *N. officinale* (white or common watercress) (USFWS 2009f, CNDDB 2024, USFWS 2022b). Pure Gambel's watercress is currently known from the populations on VSFB in Santa Barbara County and one population that was introduced in 2008 within the Guadalupe-Nipomo Dunes National Wildlife Refuge, where a combination of 600 marsh sandwort and Gambel's watercress plants were planted at eight sites (Table 3-20). The plants have not fully established at the refuge, and the USFWS does not consider it to be a viable population (USFWS 2011c).

Conservation goals and objectives listed in section 5.2.8 and AMMs listed in section 5.3 endeavor to fulfill several of the recovery objectives listed above. CDPR will continue to monitor and document Gambel's watercress and work to expand the existing populations in the HCP area by protecting and enhancing its habitat. The goals and objectives in this HCP protect, maintain, and enhance habitats by protecting water quality, restoring habitat, removing invasive species, and avoiding habitat and occurrences during covered activities.

All known Gambel's watercress populations occur in areas with limited access by the public. Because of their limited distribution, the modification of Gambel's watercress or its habitat will not be allowed, except in the case of safety issues (e.g., replacing a failing culvert in suitable habitat). Even then, the habitat disturbance will be temporary in nature, and any Gambel's watercress that could be impacted will be transplanted, if feasible.

Gambel's watercress was observed in the HCP area at Oso Flaco Lake in 2013 and again in 2018, but access to count individuals was limited. CDPR staff discovered 1 individual plant in 2020 and was still present in 2022 with approximately 10 stems visible above the floating California bulrush substrate where it was growing. No permanent loss of habitat will occur under this HCP, and the loss of 15 individuals over the course of the permit term will not substantially affect the Gambel's watercress population and distribution on site, especially since individuals that are encountered and could be impacted will be transplanted, as feasible, and CDPR will continue to monitor the transplanted individuals. In addition, CDPR will continue to remove invasive species and monitor water quality at Oso Flaco Lake, which will ultimately improve habitat for this species. Finally, although this HCP anticipates

that 15 individuals could be lost, this is a worst-case scenario, and it is likely that only a few (if any) individuals will actually be impacted. Therefore, Oso Flaco Lake will likely continue to provide some of the only remaining suitable habitat for this species.

4.10.4.3 La Graciosa Thistle

La Graciosa thistle has only been found on the coast of southern San Luis Obispo and northern Santa Barbara counties. La Graciosa thistle has probably always had a limited range, but it has declined significantly in population numbers and number of occurrences in the past 20 years. According to the 5-year review completed by the USFWS in 2019, there are only five extant occurrences of La Graciosa thistle among three populations at Callender Dune Lakes, Guadalupe Dunes, and the Santa Maria River ((USFWS 2019a)).

The habitat that La Graciosa thistle occurs in has disappeared and degraded due to development and urbanization, which is the main threat to the persistence of La Graciosa thistle. Development and urbanization cause direct habitat loss and fragmentation, as well as degradation due to erosion, sedimentation, nutrient loading, and invasive species. Biostimulation, a process in which nutrients are added to the environment to accelerate the growth of certain bacteria, also threatens La Graciosa thistle habitat. Other activities such as oil extraction, ground water diversion, and grazing are additional threats. Rising sea levels from global climate change and lowering water levels from drought and possibly groundwater over use in dune lakes also threaten coastal La Graciosa thistle habitat.

Conservation goals and objectives listed in section 5.2.8 and AMMs listed in section 5.3 endeavor to fulfill several of the recovery objectives listed. CDPR will continue to monitor and document these species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. The goals and objectives protect, maintain, and enhance La Graciosa thistle habitat by protecting and restoring habitat, removing invasive species, and avoiding habitat and occurrences during covered activities.

A loss of up to 25 La Graciosa thistle individuals due to covered activities could occur during the permit term (i.e., no more than one per calendar year). However, although this HCP anticipates that 25 individuals could be lost, this is a worst-case-scenario, and it is likely that fewer individuals will actually be impacted. In addition, if habitat cannot be avoided during covered activities, there may potentially be a permanent loss of up to 35 acres of La Graciosa thistle habitat. However, CDPR will avoid impacting La Graciosa thistle and its habitat to the extent feasible, and this HCP likely overestimates the amount of impacts that will occur. In addition, a total of 549 acres of La Graciosa thistle habitat is present in the HCP area; therefore, a loss of 35 acres over the permit term will not significantly impact La Graciosa thistle habitat on site since 514 acres of suitable habitat will still remain. Furthermore, most of the 35 acres of habitat that is mapped is not known to support La Graciosa thistle and is likely only marginally suitable habitat since it contains bare ground or minimal vegetation. CDPR will also continue to remove invasive species in the HCP area, which will ultimately improve habitat for this species. Because a large amount of suitable habitat for La Graciosa thistle will remain in the HCP area, the HCP area will also continue to provide connectivity to nearby sites where La Graciosa thistle has been observed.

4.10.4.4 Nipomo Mesa Lupine

The single remaining population of Nipomo Mesa lupine is threatened by habitat fragmentation, climate change, low genetic diversity, herbivory by pocket gophers, and habitat loss due to invasive veldt grass that aggressively invades dunes on the Nipomo Mesa. Nipomo Mesa lupine also has an affinity for growing on and near sand access roads that are used by CDPR staff to access the Phillips 66 Leasehold, leading to some mortality by vehicle damage. Another cause for concern is that all known members of

the species occur in several distinct patches within a 3-square-mile area, leaving the population highly susceptible to local-disturbance events.

CDPR will continue to monitor and document these species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. Conservation goals and objectives listed in section 5.2.8 and AMMs listed in section 5.3 protect, maintain, and enhance Nipomo Mesa lupine habitat by protecting and restoring habitat; removing invasive species; avoiding habitat and occurrences during covered activities, to the extent feasible; and minimizing impacts in habitat by implementing AMMs, such as timing activities to occur prior to the blooming period.

With the conservation goals, objectives, and AMMs in place, no permanent loss of habitat for Nipomo Mesa lupine will occur under this HCP. This HCP estimates a loss of 200 individuals over the course of the permit term (or no more than 10 in any calendar year); however, CDPR will avoid impacts to this species to the extent feasible and this estimate is likely a worst-case scenario. In addition, any impacts to this species in the HCP area would be the result of caging, habitat enhancement and restoration that would ultimately benefit the species by removing non-native, invasive species that are known to outcompete Nipomo Mesa lupine. As a result, the HCP area will continue to provide some of the last remaining habitat for this species.

4.10.4.5 Surf Thistle and Beach Spectaclepod

Surf thistle is known from 19 sites and is endemic to the ocean bluffs and ocean-facing foredunes along the coast of California from Point Conception to Pismo Beach (CNDDB 2024). The species was threatened by oil production, missile facility construction, beach users, recreational vehicles, cattle, and invasive iceplant. At the time of listing in 1990, approximately 57 percent of the recorded locations were on VSFB (CDFG 2005).

Beach spectaclepod is known from 25 sites and is found sporadically along the coast from northern Baja California to San Luis Obispo County and on two of the California Channel Islands (CNDDB 2024).

CDPR will continue to monitor and document these two species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. Conservation goals and objectives listed in section 5.2.8 and AMMs listed in section 5.3 protect, maintain, and enhance beach and foredune habitat by protecting and restoring habitat, removing invasive species, and avoiding habitat and species occurrences during covered activities.

CDPR will avoid impacting surf thistle and beach spectaclepod, if possible. The loss of 100 individuals for each species over the course of the permit term will not substantially affect either species' population and distribution on site, since over 2,000 surf thistle individuals and over 1,400 beach spectaclepod individuals have been observed on site in the past. In addition, this estimate is a worst-case-scenario, and it is likely that fewer individuals will actually be impacted.

Up to 35 acres of beach spectaclepod and/or surf thistle habitat could also be permanently lost; however, CDPR will avoid impacting this habitat if possible. In addition, a total of 870 acres of suitable habitat for surf thistle and beach spectaclepod is present in the HCP area; therefore, a loss of 35 acres over the permit term will not significantly impact habitat for these species on site, since 835 acres of suitable habitat will still remain. CDPR will also continue to remove invasive species in the HCP area, which will ultimately improve habitat for these species. In addition, the HCP area will continue to provide suitable habitat for both species and, thus, continue to contribute to the amount of habitat available on the Central Coast.

4.11 Effects on Critical Habitat

As defined in FESA, critical habitat is a specific geographic area that contains features essential for the conservation of a listed species and that may require special management and protection. In determining critical habitat for listed species, the USFWS must identify the physical and biological features essential to the conservation of the species. Such features "support the life-history needs of the species, including but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features… Features may include habitat characteristics that support ephemeral or dynamic habitat conditions" (50 CFR §424.02).

The USFWS has designated critical habitat for SNPL, CRLF, tidewater goby, and La Graciosa thistle. Critical habitat for SNPL, tidewater goby, and La Graciosa thistle is present within the HCP area. No designated CRLF critical habitat is present within the HCP area (USFWS 2006). Critical habitat descriptions in the following discussion are from the respective Final and Proposed Rules for each species designating critical habitat.

Under FESA, if a proposed action (in this case, USFWS issuance of an ITP) will adversely affect designated critical habitat, a federal agency must consult with the USFWS to determine if the proposed activities might result in the "destruction or adverse modification" of critical habitat. "Destruction or adverse modification…" is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include … those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (50 CFR §402.2). The USFWS issues a biological opinion at the conclusion of the consultation process evaluating effects on critical habitat and other relevant FESA matters. The evaluation considers conservation activities within critical habitat included as part of the proposed action to mitigate the adverse effects of the action on critical habitat (USFWS 2016).

The definition of "destruction or adverse modification" requires that the USFWS consider effects on both the survival and recovery of listed species, consistent with the definition of conservation (50 CFR §424.02). The analyses of effects on critical habitat in this HCP are consistent with this definition.

4.11.1 Western Snowy Plover

The USFWS finalized the current critical habitat designation for the Pacific Coast SNPL population in 2012 (USFWS 2012a). The designation includes 24,527 acres in 60 units in Washington, Oregon, and California. The Pismo Beach/Nipomo Dunes unit (Unit CA 31) contains critical habitat within the HCP area.

Pismo Beach/Nipomo Dunes (Unit CA 31) includes 1,652 acres, of which 780 acres (47 percent of Unit CA 31; 3 percent of all designated SNPL critical habitat) occurs within the HCP area in Pismo State Beach and Oceano Dunes SVRA. The HCP area critical habitat extends along the coast from just north of Arroyo Grande Creek south through the southern end of Oceano Dunes SVRA (Map 10). The entire Unit CA 31, including locations outside the HCP area, extends about 12 miles along the coast from the north side of Arroyo Grande Creek at the south end of Strand Way to about 0.4 mile north of Mussel Point (USFWS 2011e) and includes portions of the Guadalupe-Nipomo Dunes National Wildlife Refuge, which is owned and managed by USFWS; the Guadalupe Restoration Project, the former oil field that is owned and managed by Chevron Corporation; Rancho Guadalupe County Park, which is owned and managed by the County of Santa Barbara; and private property, including Corralitos Ranch just north of VSFB.

The SNPL critical habitat designation concluded that the physical and biological features essential to the conservation of the species[81] included sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with:

1. Areas that are below heavily vegetated areas or developed areas and above the daily high tides;
2. Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;
3. Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in physical and biological features 2 (above) for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults; and
4. Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior (USFWS 2012a).

The critical habitat designation noted that the HCP area includes the following physical and biological features essential to SNPL: wind-blown sand dunes, areas of sandy beach above and below the high tide line with occasional surf-cast wrack supporting small invertebrates, and generally barren to sparsely vegetated terrain (USFWS 2012a).

4.11.1.1 Past and Present Activities

When taking into consideration the effects of covered activities in the HCP area on critical habitat, it is important to understand the history of activities in the HCP area that were occurring prior to the HCP. The following paragraphs provide a brief history of activities in the HCP area.

Recreation in the HCP area precedes CDPR acquisition of the HCP area. Therefore, recreation and other uses of the beach and dunes within the HCP area, and corresponding management, have evolved over time. As early as 1900, people rode horses and buggies on the shoreline. In addition, a two-story dance pavilion (i.e., Oceano Pavilion) was constructed on the beach just south of Pier Avenue, and soon after, a 1,000-foot pier was constructed at the end of Pier Avenue. Much of the pier was removed in 1931 to make room for auto racing, but the pavilion remained until 1961 (Hammond 2004). In 1907, construction of another large dance pavilion (i.e., the La Grande Pavilion) and pier was completed on what is now referred to as Pavilion Hill in the north end of Oceano Dunes SVRA (Map 3). At about the same time, people started driving cars on the beach and even explored the dunes on early motorcycles. Early advertisements for lots in Oceano described a strand “18 miles long of clean white sand” boasting “the fastest automobile track in America” (Austin and Hammond 2010). By 1915, photos show long lines of automobiles parked on the beach. After World War II, and especially with the growth of dune buggies in the late 1950s and 1960s, motorized vehicles traversed the publicly- and privately-owned beach and

[81] At the time critical habitat was designated, the USFWS referred to the physical or biological features essential for the conservation of this species as primary constituent elements (PCEs). The term PCE is no longer included in the FESA regulations.

dunes from the north end of Pismo Beach, all the way to Point Sal in Santa Barbara County. Camping along the beach and in the dunes also grew in popularity.

CDPR acquired 140 acres of land in the HCP area in 1934, which it developed by 1947 as the Oceano Campground. In 1949, CDPR acquired the Pismo Beach Pier from the County. Acquisition of major portions of Pismo State Beach continued into the 1960s. In 1974, CDPR purchased the first portion of Oceano Dunes SVRA when it acquired 847 acres (from about Post 7 to Post 8) with the intent of continuing the existing OHV recreation. At the time of acquisition, access to the beach and dunes was largely uncontrolled, and vehicles stretched bumper to bumper for 5 or 6 miles along the beach on major holidays (CDPR 1975). In addition, at that time, some vehicles accessed Oceano Dunes SVRA from private lands along Oso Flaco Road.

Having assembled most of the operational boundaries of the current state beach and Oceano Dunes SVRA by 1982, CDPR established the current formal entrance stations and fenced boundaries, pursuant to CDP 4-82-300. These boundaries demarcated the motorized and non-motorized recreation areas and reduced motorized access to much of the HCP area and surrounding lands. In 1991, CDPR erected the first seasonal exclosure as part of its resource management program.

4.11.1.2 Effects of Covered Activities on Critical Habitat

In the final rule designating SNPL critical habitat in the HCP area (USFWS 2012a), the USFWS acknowledged that portions of Oceano Dunes SVRA have been degraded by recreation activities. For example, past and ongoing motorized and pedestrian recreation in the HCP area disturb SNPL, particularly during the breeding season, when park visitation rates are high. However, this habitat degradation did not preclude the USFWS from designating these areas as critical habitat if the areas contain physical or biological features essential to the conservation of the SNPL and otherwise meet the definition of critical habitat. The USFWS noted use of an area for recreational activities does not preclude the use of the area by SNPL (USFWS 2012a).

While some covered activities have occurred for even longer, the majority of the covered activities have been occurring in the HCP area for over 25 years, including at the time when the USFWS designated SNPL critical habitat. For example, at least some covered activities currently occur within and will continue to occur within almost all of the 776 acres of SNPL critical habitat in the HCP area. These activities will be conducted in the same manner as they were conducted at the time critical habitat was designated. Within the critical habitat, 322 acres of critical habitat will be open to motorized recreation and camping at least part of the year (i.e., the Southern Exclosure will be erected during the SNPL and CLTE breeding season and closed to all recreation during this time). Approximately 255 acres open to motorized recreation will continue to be seasonally closed via exclosure and symbolic fencing to motorized activities during the SNPL and CLTE breeding season. Additionally, 62 acres (i.e., the 6 Exclosure) will continue to be closed to motorized vehicles during the SNPL and CLTE breeding season until certain criteria are met and the 6 Exclosure can be reduced (section 5.2.3). Ultimately, approximately 62 acres of critical habitat could be open again to motorized recreation year-round as a result of removing the 6 Exclosure (East Boneyard Exclosure lies outside of SNPL critical habitat). Note that acreages are approximate and the seasonality of use may vary over the permit term depending on operational needs and requirements of other programs.

Heavy recreational use in critical habitat was occurring within the HCP area at the time critical habitat was designated, and seasonal exclosures were not included as part of the critical habitat designation; therefore, critical habitat for SNPL will not be adversely changed by ongoing recreational activities or a reduction in the Southern Exclosure. Heavy recreational use in the HCP area may continue to make some designated SNPL critical habitat largely unsuitable for nesting or wintering activities. Specifically, SNPL may continue to use areas that are heavily used by humans, but productivity may be limited. For

example, motorized activities can reduce prey availability (i.e., reducing habitat quality by altering or reducing wrack, which provides essential habitat for talitrids); reduce habitat quality (e.g., removing/destroying objects such as kelp and driftwood associated with nesting); reduce microtopographic complexity, which provides cover from predators and inclement weather; and prevents the establishment of foredune vegetation, which can provide microhabitat features that can support nesting and roosting.

SNPL typically nest within critical habitat such as in the Exclosures (i.e., Southern Exclosure and North Oso Flaco), which will not be impacted by mechanical trash removal given that this activity will not be conducted in any fenced closed areas where known SNPL nesting occurs. Mechanical trash removal will only occur above the wrack line in the Grand Avenue and Pier Avenue entrance areas, the Post 2 trash dumpster areas, Post 2 south to Post 4.5 and the open area to Post 6 (which is east of the 48-acre foredune area). Mechanical trash removal will not occur within vegetated areas or any lagoon or creek. Mechanical trash removal could occur within SNPL critical habitat that is outside the Southern Exclosure and 48-acre foredune area by altering dune composition and topography. Specifically, mechanical trash removal could reduce micro-topography and/or organic surface materials (e.g., driftwood and campfire charcoal) that are scattered throughout the HCP area above the wrack line. Most mechanical trash removal will be conducted to remove litter in areas where recreation activities have been concentrated and the substrate is already highly disturbed. These areas have always supported marginally suitable SNPL nesting habitat due to the ongoing high level of recreation (i.e., presence of humans, pets, vehicles, and/or human attracted predators)[82]. As a result, this effect will be minimal.

Mechanical trash removal will not be conducted at or below the wrack line; therefore, these activities are not anticipated to impact any physical and biological features related to shoreline habitat areas for SNPL feeding (i.e., foraging habitat) at or below the wrack line. Although mechanical trash removal does not occur within the Southern Exclosure, habitat enhancement within that area is also expected to offset some impacts of mechanical trash removal on SNPL critical habitat where it does occur and potentially reduces foraging substrate. Specifically, the habitat enhancement activity includes collecting wrack and placing it on the shoreline of the Southern Exclosure at the beginning of the breeding season to provide cover for nesting SNPL and inoculating the wrack with talitrids (commonly called beach hoppers) to ensure a sustainable population of wrack-associated invertebrates, SNPL prey, are present in the main SNPL breeding and foraging area (i.e., Southern Exclosure shoreline).

Although mechanical trash removal will only occur above the wrack line, mechanical trash removal could remove scattered debris (e.g., driftwood and dried kelp) from the previous winter wrack line still present in the beach area above the wrack line, which can be important habitat for wrack-associated beach invertebrates. This material may not have time to naturally develop again, and species richness, abundance, and biomass of wrack-associated invertebrates that are important SNPL prey resources could decline. As a result, wintering SNPL could be impacted by a reduced prey source. Pre-identified and targeted locations are planned to be treated no more than twice a year unless additional treatments are found necessary and planned for appropriately. CDPR will implement AMM 110, which includes implementing a study to determine the impact of mechanical trash removal on wrack-associated invertebrates. If a substantial decline in invertebrates is observed, CDPR will implement additional measures to reduce the impact, such as reducing the frequency of mechanical trash removal,

[82] USFWS acknowledged that habitat at Oceano Dunes SVRA was already degraded at the time of listing by recreation activities, but it did not preclude the USFWS from designating it as critical habitat (USFWS 2012a).

and/or reducing the mechanical trash removal locations. As a result, mechanical trash removal will have a minimal impact on critical habitat.

Critical habitat will be affected by vegetation planting associated with dust control activities in the 48-acre foredune area. Additionally, some air quality monitoring equipment may be installed within SNPL critical habitat, although such installations are assumed to be temporary. Dust control projects will not be conducted at or below the wrack line; therefore, these projects are not anticipated to impact any physical and biological features related to foraging habitat. Vegetation planted in critical habitat could make these areas largely unsuitable for SNPL nesting by reducing the amount of open, wide beaches necessary for SNPL breeding habitat. Areas with air quality monitoring equipment would also be unsuitable for nesting, although if the equipment is removed the impact would cease. Although most SNPL were known to nest within the Exclosures in the past, SNPL have nested in the 48-acre foredune area each breeding season since it was closed in 2020. The added foredune vegetation is set back from the shoreline, and the randomly spaced native vegetation in the initial stages of restoration has provided suitable nesting habitat with lightly scattered vegetation. The area has thus retained most of the physical and biological features essential to the conservation of SNPL, although the quality may change further over the HCP term depending on the extent of vegetation installation and how conditions evolve within the foredune. Overall, vegetation planting in the 48 acres of critical habitat will only modify approximately 6.2 percent of the total critical habitat in the HCP area, approximately 2.9 percent of total critical habitat in Unit CA 31, and approximately 0.02 percent of the total critical habitat range-wide. Additionally, all or a portion of the Southern Exclosure may be closed temporarily or permanently during the non-breeding season based on operational or regulatory considerations. Because CDPR will manage the Southern Exclosure habitat to ensure it retains the characteristics of primary habitat as described in section 3.3.1.8 and indicated by breeding productivity, the area will continue to contain the physical and biological features essential to SNPL conservation.

Despite the potential effect on critical habitat described above, CDPR has intensively monitored and managed habitat for breeding and overwintering SNPL in the HCP area for decades and will continue to do so in the future. Implementation of this HCP (i.e., implementation of the conservation program and AMMs, resource monitoring, and adaptive management, Chapter 5), will continue to minimize any effects on critical habitat and, ultimately, SNPL reproductive success. The conservation program (e.g., use of seasonal exclosures to close off some portion of suitable/critical habitat for SNPL during the breeding season, predator management, enforcement of park rules, enhancement of active breeding habitat) detailed in this HCP is designed to contribute to the recovery of SNPL by continuing to protect large nesting habitat areas, adults, eggs, and young from and minimizing conflicts with recreation, park operations and management, and predators.

4.11.2 Tidewater Goby

The revised Final Rule designating critical habitat for tidewater goby was published on February 6, 2013 (USFWS 2013d). In its designation, the USFWS determined that the physical and biological features essential to the conservation (referred to at the time of designation as PCEs) of the tidewater goby are:

1. Persistent, shallow (in the range of about 0.3 to 7 feet), still-to-slow-moving, aquatic habitat most commonly ranging in salinity from 0.5 ppt to about 10 to 12 ppt, which provides adequate space for normal behavior and individual and population growth;
2. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
3. Submerged and emergent aquatic vegetation, such as sago pondweed *(Stuckenia pectinata*), ditchgrass (*Ruppia maritime*), common cattail (*Typha latifolia*), and bulrush (*Scirpus* sp.) that provides protection from predators; and

4. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity (USFWS 2013d).

The USFWS final designation of critical habitat for tidewater goby (USFWS 2013d) includes 20 acres in Pismo Creek Lagoon (Unit SLO-11; Map 17). USFWS determined this area was threatened by coastal development, channelization, and non-point and point source pollution (USFWS 2013d). The critical habitat unit at Pismo Creek Lagoon in Pismo State Beach (Unit SLO-11) is within the HCP area. This designated habitat unit provides the following essential functions for species recovery:

1) space for individual and population growth and for normal behavior;
2) food, water, air, light, minerals, or other nutritional or physiological requirements; and,
3) cover and shelter (USFWS 2008a).

Across the mouth of Pismo Creek's estuarine Lagoon, an intermittent sandbar occasionally forms during the late spring, summer, and/or fall that closes or partially closes the lagoon, thereby providing relatively stable conditions and fulfilling physical and biological feature 4 above. According to the USFWS (USFWS 2008a), physical and biological features 1, 2, and 3 (above) occur throughout the unit, although their precise locations may change in response to seasonal fluctuations in precipitation and tidal inundation. Within the critical habitat in the HCP area, tidewater goby were found to be "common" in February 2008 (Swift, C., pers. comm. 2008) and September 2007 (Rischbieter 2008). Tidewater goby has been confirmed present every year since (e.g., (Rischbieter 2017)). Prior to the 2008 and 2007 surveys, presence of tidewater goby was last confirmed in 1999 (C. Swift, pers. comm., as cited in (USFWS 2005a). The Pismo Creek Lagoon goby population is important as it is considered to be a source population for other areas, possibly including Arroyo Grande Creek and Estuary.

Habitat at Pismo Creek is threatened by coastal development, water diversion, and channelization (USFWS 2008a). Although much of the tidewater goby critical habitat at Pismo Creek occurs within the boundaries of the HCP area, all of the threats to that habitat listed in the critical habitat designation (coastal development, water diversion, channelization, water pollution, and cattle grazing) occur off site and are generally out of the control of CDPR. All the habitat impacts, such as increased turbidity, will be temporary amid a dynamic tidal system.

The USFWS also added a new critical habitat unit at Oso Flaco Lake (Unit SLO-12). Unit SLO-12 encompasses approximately 171 acres and comprises 165 acres of CDPR lands and 6 acres of private lands. The USFWS defined this critical habitat unit as an area "outside the geographical area occupied by the species at the time of listing, is not known to be currently occupied, and there are no historical tidewater goby records for this location" (USFWS 2013d). However, the USFWS found this unit is essential for the conservation of the species because "it provides habitat to nearby occupied units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region" (USFWS 2013d). It is suspected that this unit has the potential to provide habitat for tidewater goby that disperse from Arroyo Grande Creek and Estuary and the Santa Maria River and allow for connectivity between populations; however, water quality impairments may prevent tidewater goby from establishment at this area. Of note, tidewater goby occupancy of this area was recorded for the first time during surveys conducted in March of 2017 after weeks of drought-alleviating rain, when two adult tidewater gobies were collected within a short reach extending from the surf zone to where Oso Flaco Creek exits the dunes (Rischbieter, Douglas, pers. comm. 2017), and the species continues to be found there intermittently.

Covered activities under the HCP are more likely to impact individual fish, rather than the habitat for an entire population. Park visitors may inadvertently harm individual fish or destroy nests while playing in lagoon waters. Maintenance or Ranger vehicles passing through creek mouths could trample individual fish (although gobies generally do not use this area during normal flow conditions). Fish monitoring methods such as seining in the lagoon or electroshocking in the creek just upstream from the lagoon have the potential to cause injury or mortality to individual fish; however, established AMMs will continue to reduce negative effects. These covered activities do not modify critical habitat features or impair the quality of habitat.

4.11.3 La Graciosa Thistle

The La Graciosa thistle critical habitat was designated November 3, 2009 (USFWS 2009c). Approximately 24,103 acres were designated as critical habitat in San Luis Obispo and Santa Barbara counties (the Callender-Guadalupe Dunes critical habitat unit). The physical and biological features essential to the conservation (referred to at the time of designation as PCEs) of La Graciosa thistle specific to the Santa Maria Dunes Complex and the Callender-Guadalupe Dunes critical habitat unit where the HCP Area is situated include:

1. "Mesic areas associated with: (a) margins of dune swales, dune lakes, marshes, and estuaries that are associated with dynamic (changing) dune systems including the Santa Maria Valley Dune Complex; (b) margins of dynamic riparian systems including the Santa Maria River and (c) freshwater seeps and intermittent streams found in other habitats, including grassland, meadow, coastal scrub, chaparral, and oak woodland. These areas provide space needed for individual and population growth including sites for germination, reproduction, seed dispersal, seed bank, and pollination;
2. Associated plant communities including: Central dune scrub, coastal dune, coastal scrub, freshwater seep, coastal and valley freshwater marsh and fen, riparian scrub (e.g., mule fat scrub, willow scrub), oak woodland, intermittent streams, and other wetland communities, generally in association with the following species: *Juncus* spp. (rush), *Scirpus* spp. (tule), *Salix* spp. (willow), *Toxicodendron diversilobum* (poison oak), *Distichlis spicata* (salt grass), *Baccharis pilularis* (coyote brush), and *B. douglasii* (*Douglas' baccharis*);
3. Soils with a sandy component including but not limited to dune sands, Oceano sands, Camarillo sandy loams, riverwash, and sandy alluvial soils; and
4. Features that allow dispersal and connectivity between populations, particularly natural aeolian geomorphology in the Santa Maria Dune Complex that is not confined by barriers or wind-blocks such as large manmade structures, tree rows, or windbreaks (allowing uninterrupted winds across these areas)."

Because the sand dune habitat is a dynamic system, unvegetated areas are also included as physical and biological features essential to La Graciosa thistle to account for migration of vegetated habitat patches over time (USFWS 2009c). The critical habitat designated in the HCP area includes physical and biological features necessary for the survival of the species, including vegetated habitat patches and open sand dune swales. Any conversion of this habitat will result in loss of physical and biological features essential to the conservation of the species.

La Graciosa thistle critical habitat encompasses 2,749 acres within the HCP area (Map 20). One or more covered activities, including motorized activities, pedestrian and equestrian recreation, natural resource management, limited trail riding area, cultural resource management, and special projects may occur within 2,046 of those 2,749 acres (Map 31), but most of these activities will cause minor and/or

temporary effects, and most are ongoing. Permanent adverse changes to La Graciosa thistle critical habitat are anticipated to be negligible. Activities that could impact La Graciosa thistle critical habitat are described in more detail below.

Motorized Recreation. There are approximately 94 acres of critical habitat comprised of sandy dunes that are open to motorized recreation. These are outside of the vegetation islands and do not currently contain the physical and biological features for La Graciosa thistle in appropriate quantity and spatial arrangement necessary to provide the features essential to the conservation of La Graciosa thistle. These areas were designated as critical habitat because the vegetation islands may migrate beyond their current boundaries in the foreseeable future (USFWS 2009c) and, as a result, could be considered suitable habitat for La Graciosa thistle at that time. Additionally, approximately 4.8 acres of critical habitat currently closed to recreation within the limited trail riding area may be opened to motorized recreation on a seasonal basis, and a motorized trail system may also be installed in the area. Motorized recreation may affect critical habitat by crushing vegetation, seedlings, and seeds of plants representative of the vegetation islands, including La Graciosa thistle that may occur outside of the protected vegetation islands thereby preventing migration of vegetation in these islands into the areas open to riding. Motorized recreation may indirectly affect the vegetation islands by increasing sand movement into the vegetated islands and other vegetated critical habitat.

Pedestrian Recreation. Pedestrian activity is generally allowed throughout La Graciosa thistle critical habitat, including vegetated areas such as the vegetation islands (unless posted as closed) and the area around Oso Flaco Lake. Pedestrian activity in vegetated areas is uncommon, however, and potential effects of these activities are anticipated to be very low, as occasional walking through vegetation is not expected to adversely, nor permanently, affect vegetation. No pedestrian activities are allowed in the Phillips 66 leasehold area; therefore, critical habitat in this area will not be affected.

Equestrian Recreation. Equestrian recreation is allowed within La Graciosa thistle critical habitat in the Dunes Preserve and the vegetated islands, but not within La Graciosa thistle critical habitat around Oso Flaco Lake. Equestrians rarely enter the vegetation islands and generally stay on trails through other vegetated areas; therefore, equestrian recreation is not anticipated to adversely affect critical habitat. Equestrian use in the open dunes is not anticipated to be frequent or intensively localized around existing vegetation islands and other vegetated habitat; therefore, it is not anticipated to prevent migration of vegetation.

Natural Resources Management Activities. Temporary and indirect effects on La Graciosa thistle habitat could occur during natural resource management activities, such as habitat restoration, invasive plant control, and plant species monitoring. However, these effects will continue to be minimized by implementation of AMMs in section 5.3. In addition, these natural resource management activities benefit La Graciosa thistle and its habitat. Dune slack restoration at Jack and Surprise lakes will incorporate transitional banks and swales that provide La Graciosa thistle habitat (see section 5.3.2.1.3).

Dust Control, Cultural Resources Management, and Special Projects. Up to 142 acres[83] of La Graciosa thistle critical habitat may be affected by the limited trail riding area, dust control activities, cultural resource management, the construction of special projects due to ground disturbance or new vegetation planting associated with these activities. These activities would result in an actual change in

[83] Total includes 5 acres of cultural resource management measures, 94 acres subject to motorized recreation that could be closed for dust control, 3 acres of temporary air quality monitoring equipment, 35 acres of special projects, and 5 acres of trail riding in the Limited Trail Riding Area.

existing habitat conditions, as opposed to the conditions resulting from ongoing recreation, but not all such changes would be adverse (e.g., vegetation plantings for dust control). Specifically, a new facility constructed as a special project within La Graciosa thistle critical habitat would permanently remove critical habitat. The dust control activities will primarily be installed in sandy dune habitat, so no impacts to existing mesic habitats are expected, and any vegetation installed potentially provides new habitat for La Graciosa thistle colonization. Similarly, sensitive cultural resources sites are typically protected from recreation activities and thus may also benefit La Graciosa thistle by prohibiting recreation activities from La Graciosa thistle habitat. Additionally, since much of the La Graciosa thistle critical habitat designation avoided the sandy dune habitat open to riding, dust control activities such as additional wind fencing and vegetation planting may largely be outside the boundaries of designated critical habitat. Overall, removing up to 35 acres of critical habitat for special projects and cultural resource management activities only represents 0.01 percent of the total amount of critical habitat currently available within the HCP area. In addition, AMMs listed in section 5.3 (e.g., restoring vegetation to pre-activity conditions) will be implemented for these activities and are expected to avoid or minimize effects on La Graciosa thistle critical habitat.

4.12 Cumulative Impacts

Cumulative effects are the incremental environmental effects of the action together with the effects of the past, present, and reasonably foreseeable future actions, regardless of which agency (i.e., federal or non-federal) or person undertakes those actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time (40 CFR §1508.7). An analysis of cumulative effects is not required in an HCP; however, the HCP includes a brief analysis here to support the federal Biological Opinion that will conclude the USFWS section 7 internal consultation process (section 1.5).

As described above, the impacts of covered activities were assessed relative to the conditions in the HCP area. Development and other activities in the surrounding communities, which are outside the scope of this HCP, may contribute to cumulative impacts on covered species. Thus, other activities and projects in the region that are not covered by this HCP may, in conjunction with this HCP, affect the covered species. Specific projects not covered in the HCP that may impact the covered species are described below. Additional potential cumulative impacts are described in the EA for this HCP. The cumulative impact analysis addresses a relatively local geographic area that includes Pismo Beach, Grover Beach, and Lopez Dam.

4.12.1 Urban Growth

Future development on land surrounding the HCP area, including the cities of Pismo Beach and Grover Beach, will continue during the life of the HCP. Continued development may have a cumulative effect on all or some of the covered species, depending on the location of the development. For example, development near or on the beach could reduce foraging and/or wintering habitat for SNPL. In addition, development that results in loss of wetlands or other waters and/or stormwater runoff from urban landscapes would degrade SWPT, CRLF, WSF, and tidewater goby habitat, as well as CLTE foraging habitat. Some, or all, of these losses may be offset by mitigation. However, it is unknown at this time whether mitigation will make up for the lost functions and values of the existing habitat. Therefore, the precise impact of cumulative future growth is unknown.

4.12.2 Ongoing and Routine Agriculture

Ongoing and routine agricultural activities outside and nearby the HCP area may have some cumulative impacts on the covered species. Ongoing agriculture and herbicide/pesticide use could limit or degrade water quality for SWPT, CRLF, WSF, tidewater goby, and CLTE foraging habitat. Groundwater pumping

reduces streamflows, sometimes severely. Since the impacts of ongoing and routine agricultural activities are generally unregulated, and mitigation is not required for impacts associated with these activities, some adverse effects on covered species is expected. However, the precise impacts of ongoing and routine agriculture, and thus, the cumulative effects, are not known.

4.12.3 Operation of Lopez Dam

San Luis Obispo County operates Lopez Dam to provide domestic and agricultural water for the adjacent communities. Operation of Lopez Dam affects the quality and quantity of the aquatic habitat in Arroyo Grande Creek. Operation of the dam, including water releases, is currently the subject of litigation. Changes to streamflow would affect habitat for SWPT, CRLF, WSF, and tidewater goby.

Chapter 5. Conservation Program

5.1 Summary of Conservation Program

Section 10(a)(2)(A) of FESA requires that an HCP specify the measures that the permittee will take to minimize and mitigate to the maximum extent practicable the impacts of take on any federally listed animal species as a result of activities addressed by the HCP.

CDPR is committed to continuing its policy of avoidance and minimization of take of listed species in the management of Pismo State Beach and Oceano Dunes SVRA. This chapter describes the conservation program for this HCP. The conservation program will be implemented to protect and promote recovery for listed and covered species in the HCP area by protecting and, where appropriate, enhancing their populations. The conservation program is a program of conservation measures (i.e., actions taken to avoid or minimize take, compensate for loss of habitat, or provide for the conservation of covered species) that, when implemented, will achieve the biological goals and objectives of this HCP. The conservation program relies on several types of conservation measures including avoidance and minimization, habitat enhancement, habitat restoration, habitat creation, and population enhancement. Recovery and protection of the covered species through the conservation program will be accomplished by the following:

- Managing habitat components to benefit covered species
- Minimizing human alteration or disturbance of native habitats
- Reducing conflicts between covered species and park users
- Restoring native habitats
- Monitoring the success of these efforts
- Implementing adaptive management to ensure conservation program success
- Fully offsetting the impacts of incidental take authorized

5.2 Biological Goals and Objectives for Covered Species

HCPs must establish biological goals and objectives. The biological goals of an HCP are the broad, guiding principles for the operating conservation program and the rationale behind the minimization and mitigation strategies. The purpose of the biological goals is to ensure that the operating conservation program in the HCP is consistent with the conservation and recovery goals established for the species. The goals are also intended to provide to the applicant an understanding of why these actions are necessary. These goals are developed based upon the species' biology, threats to the species, the potential effects of the covered activities, and the scope of the HCP. The biological objectives of an HCP are the different components or measurable targets needed to achieve the biological goals.

The primary purpose of an HCP is to minimize and mitigate take of a covered animal species that occurs from otherwise lawful activities that are conducted in accordance with laws and regulations pertaining to ongoing land use. The ongoing operations of the Oceano Dunes District described above in section 2.2 are the activities covered by the HCP.

SNPL and CLTE take may occur from direct mortality or injury and from disturbance due to the close proximity of human activities to roosting, foraging, breeding, and non-breeding (SNPL) habitat, and rearing of young that occurs on open beaches and dunes. The HCP conservation program for SNPL and CLTE has three elements: 1) manage take through the strict implementation of take AMMs; 2) mitigate take by enhancing and protecting habitat and controlling for predators to maintain high levels of

breeding, nesting, and fledging success in the HCP area, allowing for natural variation in these demographic parameters; 3) monitoring to track program effectiveness consistent with adaptive management.

For SWPT, CRLF, WSF, tidewater goby, and listed plant species, take is most likely to result from habitat disturbance or destruction due to public encroachment into occupied habitat. However, some small areas of habitat may be destroyed and individuals of the species injured or killed. For these species, the conservation program will include a combination of take AMMs along with habitat enhancement and restoration to increase populations and improve habitat quality within the HCP area and fully offset the requested take.

The overall goal of the HCP for all covered species is to sustain or increase local populations of the covered species and to maintain, enhance, and/or restore habitats and naturally functioning ecosystems within the context of fulfilling the mission of the Oceano Dunes District to provide recreational opportunities.

5.2.1 Western Snowy Plover Goals and Objectives

As presented in section 3.3.1.4.1, monitoring programs from 2001 to 2023 indicate a general increase of the SNPL population in the HCP area until 2014, then a relatively level population through 2023. Overall management actions directed toward enhancing SNPL reproduction have been successful. The following goals and objectives are based on maximizing the success of implemented conservation strategies employed in the HCP area to date. The overall biological goals of the HCP for SNPL are to minimize take to the maximum extent practicable and to promote the health and viability of SNPL populations both locally and range-wide. The specific biological goals and objectives that will be implemented to achieve these goals follow. AMMs (section 5.3.1.1) will play a key role in meeting the SNPL goals and objectives.

Goal 1: Continue to contribute to SNPL recovery locally and range-wide.

Objective 1.1: Manage the SNPL population breeding in the HCP area to meet or exceed the HCP area management potential breeding number target of 180 breeding SNPL averaged over a moving 3-year window.

This objective was developed based on *The Recovery Plan for the Pacific Coast Population of the Western Snowy Plover* (USFWS 2007a). The Recovery Plan sets Management Potential Breeding Numbers for different coastal areas from Washington to southern California. These are target population sizes that USFWS believes are achievable under an intensive management scheme. The Management Potential Breeding Numbers were developed by the USFWS technical subteam of the SNPL Recovery Team. These numbers are based on survey data at breeding locations and expert opinion regarding the feasibility of management options and the extent and quality of habitat. These numbers were derived independently of the recovery criteria, so they do not exactly match the recovery criteria. The sum total of the Management Potential Breeding Numbers is about 20 percent higher than the recovery criteria subpopulation sizes (USFWS 2007a).

Some of the USFWS targets are designated for geographic areas that encompass breeding locations rather than specific ownership parcels. This is the case for the Pismo Beach/Nipomo Dunes (Unit CA-83) management area that encompasses Oceano Dunes SVRA and Pismo State Beach (Table B-1 of the Recovery Plan; (USFWS 2007a). In addition to Oceano Dunes SVRA and Pismo State Beach, this area includes potentially suitable SNPL habitat on the Guadalupe Dunes National Wildlife Refuge, the Guadalupe Restoration Project (property owned by Chevron Corporation), Rancho Guadalupe County Park, and privately-owned land. The recommended population target for this area is 350 adult SNPL.

To determine how the HCP could help meet the Recovery Plan population targets, it was necessary to determine population targets for the portion of the Pismo Beach/Nipomo Dunes management area

owned by CDPR and covered in this HCP. Because there is a paucity of historical data on SNPL numbers along the different coastline segments of the Pismo Beach/Nipomo Dunes management area, the analysis initially used relative proportions of miles of shoreline suitable for SNPL nesting, as mapped in the Recovery Plan, to directly apportion the Management Potential Breeding Numbers in the Recovery Plan to the HCP area.

Within the Pismo Beach/Nipomo Dunes management area, 13.3 miles of sandy shore are considered potentially suitable SNPL breeding habitat. The HCP area includes 5.9 miles of that sandy shore, or 44.4 percent of the potentially suitable habitat in the Pismo Beach/Nipomo Dunes management area. Based on the assumption that all the potential nesting habitat is of equal quality, the Management Potential Breeding Number for Oceano Dunes SVRA/Pismo State Beach would be 155 adult SNPL (44.4 percent of 350 adults).

All miles of sandy shoreline in the Pismo Beach/Nipomo Dunes management area may not provide equivalent potential nesting habitat. Additional analysis was thus conducted, partitioning the Management Potential Breeding Numbers for Unit CA-83 using the area of potentially suitable habitat for each subdivision within the Guadalupe/Nipomo Dunes area, rather than shoreline miles. Each subdivision was weighted by its relative "habitat suitability" for SNPL using an index of habitat suitability for the subdivisions in the Guadalupe/Nipomo Dunes region provided in MacDonald et al. (2010).

MacDonald et al. (2010) developed habitat suitability values by identifying environmental variables that best predict the occurrence of SNPL. Deductive model variables included elevation, slope gradient, distance from the coast, distance from streams and estuaries, distance from major rivers, landward boundary (e.g., dune, bluff), beach substrate (e.g., sand, gravel), beach width plus adjacent sand dunes/river sandbars, wave height, wind speed, and air/sea temperature. MacDonald et al. excluded vegetation, presence of beach wrack, and other factors that could be influenced by management in part to identify potential management actions that may improve overall SNPL distribution and population size (2010). Applying the habitat suitability values and aerial measures of available potential habitat resulted in a Management Potential Breeding Number of 155 adult SNPL for the HCP area (Table 5-1). This outcome is the same as the analysis produced based solely on shoreline length, resulting in 155 breeding adult SNPL as a population objective. However, habitat suitability models incorporating both abiotic and biotic variables (mean high higher water, percent vegetation cover, and cover type) at smaller spatial scales than MacDonald et al. (2010), may be more predictive of site occupancy at local scales (Neuman, Nur, et al. 2024). Model discrepancy between studies indicates the importance of scale and site-specific resources when making inferences on site occupancy. Additionally, biotic conditions at the local scale including prey abundance and predator abundance may be important measures of habitat suitability. If prey or predator variables are primary influencers of habitat suitability, the most accurate representation of habitat suitability may be reflected in the site conditions that fluctuate annually and the long-term population trajectory. Because the adult breeding trends in the HCP area over the last 10 years have exceeded 155 adult SNPL individuals (Table 3-8), USFWS and CDPR determined 180 breeding adult SNPL provides a more accurate biological representation of breeding potential at ODD and thus will be the population objective for this HCP.

Table 5-1. Breeding Adult SNPL Management Potential Breeding Numbers Apportioned to the Subdivisions of Pismo Beach/Nipomo Dunes (Unit CA-83) Area

Sites	Mean Habitat Suitability Value (HSV)[1]	Area (m^2)[2]	HSV Area[3]	Percent Contribution to Total[4]	Apportioned Mgmt. Potential[5]
Oceano Dunes SVRA – Day Use Area	0.839	368,850.4	309,465.5	5.0	17.5

Table 5-1. Breeding Adult SNPL Management Potential Breeding Numbers Apportioned to the Subdivisions of Pismo Beach/Nipomo Dunes (Unit CA-83) Area

Sites	Mean Habitat Suitability Value (HSV)[1]	Area (m^2)[2]	HSV Area[3]	Percent Contribution to Total[4]	Apportioned Mgmt. Potential[5]
Oceano Dunes SVRA	0.739	1,982,033.7	1,464,722.9	23.7	82.9
Oceano Dunes SVRA Oso Flaco Natural Area	0.768	1,263,065.3	970,034.2	15.7	54.9
Subtotal HCP Area		**3,613,949.4**	**2,744,222.6**		***155.3***
Guadalupe-Nipomo Dunes National Wildlife Refuge	0.737	1,096,719.1	808,282.0	13.1	45.7
Guadalupe Restoration Project	0.791	1,604,080.8	1,268,827.9	20.5	71.8
Rancho Guadalupe Dunes Preserve	0.805	1,044,292.1	840,655.2	13.6	47.6
Mussel Rock Beach	0.792	527,435.9	417,729.3	6.8	23.6
Paradise Beach	0.755	138,140.6	104,296.1	1.7	5.9
Total Unit CA-83		**8,024,617.9**	**6,184,013.1**		**350**[6]

Notes:

[1] Mean HSV for Unit CA-83 were obtained from Table 7 in MacDonald et al. (2010)..

[2] The total area of the sub-site in MacDonald et al. (2010).

[3] The percent of the total area based on the mean HSV.

[4] The percent the HSV area contributes to the total Unit CA-83 area.

[5] The management potential for the individual unit based on the total Unit CA-83 management potential.

[6] The Management Potential Breeding Number of 350 SNPL for Unit CA-83 was apportioned based on HSVs for each subdivision from MacDonald et al. (2010) and the area of each subdivision.

Objective 1.2: Maximize the reproductive success of SNPL in the HCP area to maintain a 3-year moving average of at least 1.0 fledgling per male.

In addition to a population-based objective, CDPR will continue to implement conservation actions to maintain a fledge rate necessary to sustain the SNPL population in the HCP area. Objective 1.2 is based on the Recovery Plan, which suggests 1.0 fledged young per breeding male is necessary for population stability and ≥1.2 fledged young per breeding male for population growth (USFWS 2007a). Assessing the status of the number of fledged young per breeding male requires estimating, to the highest level of accuracy, the number of breeding males and the number of young that they fledge. These data will continue to be obtained through the intensive monitoring program (including banding SNPL chicks) (section 5.4.1).

Intensive habitat enhancement and protection of nesting SNPL from predators and park visitors has made it possible to attain a level of reproductive success necessary to achieve Objective 1.2; since 2002, SNPL productivity in the HCP area has been sufficient for population growth in 16 of 22 years (Table 3-8, Figure 3-1). For the 22-year period from 2002 to 2023, the annual average number of juveniles fledged per breeding male was 1.45 (Table 3-8, Figure 3-2). Since the 2013–2015 3-year period, the running 3-year average fledglings per breeding male has exceeded 1.0 (Table 3-8, Figure 3-3).

Objective 1.3: Increase the habitat quality through habitat enhancement and restoration.

This objective is designed to maintain and improve habitats for nesting, resting, and foraging SNPL. Habitat enhancement and restoration has been successful in reclaiming SNPL habitat in other locations throughout California and Oregon. Following the SNPL and CLTE breeding season (i.e., between October and February), camping, street-legal vehicles, and OHVs are allowed in the Southern Exclosure area (see section 2.2.2.1.1). Recreational use in this area may result in some areas of flattened terrain and barren sand with very limited scattered debris and vegetation. Oceano Dunes SVRA staff place material in bare areas of the 6, 7, and 8 Exclosures to enhance SNPL breeding habitat and offer more areas of cover for SNPL that can provide shelter from wind and blowing sand, reduce exposure to predators, and augment potential nesting substrate. Habitat enhancement activities begin in February or March, prior to nest initiation, and consist of adding natural materials such as driftwood, woodchips, and wrack to the exclosures and shoreline. Habitat enhancement will not occur within 100 feet of the eastern exclosure fence that borders the open riding area in order to discourage SNPL from nesting near activities that could disturb breeding birds.

Dense vegetation has developed in the Southern Exclosure over more recent years, resulting in increasingly tall, vegetated hummocks and severe topography. Concurrently, nesting by SNPL in these areas shows a marked decrease. Although nests in dense vegetation are more difficult to locate, the lower nest numbers are likely due to the combination of substrate and viewshed not being appropriate for nesting and the large hummocks attracting avian predators as perch locations. As of 2023, approximately 25% of the acreage in 6, 7, and 8 Exclosures (roughly 40 acres mostly on the west side) has become less productive for SNPL, with nest numbers in this area having 12.8% of the total nests during the 2016 to 2020 period compared to only 4.1% since the year-round closure from 2021 to 2023 (CDPR 2023). There were a total of 52 SNPL nests in an approximately 20-acre area on the west side of 8 Exclosure where topography is highest from 2016 to 2020, and only 3 nests from 2021 to 2023 in the same area.

Oceano Dunes SVRA staff will conduct habitat manipulation in the Southern Exclosure to reduce the density of vegetation, focusing on invasive species, and remove larger dune hummocks to maintain the characteristics of primary habitat as defined in section 3.3.1.8 and indicated by breeding productivity, including the breeding number and fledge rate targets in Objectives 1.1 and 1.2, respectively. The intent will be to mimic the natural action of creek and river mouths, which can clear out acres of vegetation in one storm event to create “blow-out” areas within the foredune habitat, extremes for which foredune habitats are adapted. Vegetation at the very western edge of the exclosure will be avoided since these hummocks are beneficial to SNPL broods as a place to take cover from predators and shelter from wind. Only large hummocks would be targeted, small hummocks left in place, with a goal of creating a mosaic of plants and open sand areas attractive to SNPL for nesting. A trained monitor will also be present during mechanical removal to ensure all wildlife remains safe and any sensitive plants are avoided.

Habitat restoration in North and South Oso Flaco could improve nesting habitat for SNPL and may provide additional wintering habitat by creating more open beach and/or adjacent foredune areas through the removal of invasive species. With the removal of invasive species and recontouring of the dune areas, SNPL may begin to use these areas for nesting and wintering activities.

CDPR will continue to examine the condition of the topography and vegetation growing in the exclosure along with nesting outcomes and will update the approach to habitat management as new information becomes available.

Objective 1.4: Reduce predation.

Predators are one of the primary causes for the loss of SNPL adults, eggs, and chicks. This objective involves managing predator populations by deterring predators, relocating predators, and/or lethally removing predators to reduce predation on SNPL adults, juveniles, chicks, and eggs (section 2.2.2.1.2).

Objective 1.5: Reduce disturbance by recreational users and predators.

This objective involves protecting nesting SNPL, their nests, and chicks from predators and park users that may inadvertently or otherwise cause harm by using exclosures and symbolic fencing (section 2.2.2.1.1).

Virtually all SNPL nests at Oceano Dunes SVRA will receive some type of fence protection (generally, only those few nests that are not discovered by monitors do not receive some type of fence protection). CDPR will maintain the current relative size and configuration of the seasonal exclosure (i.e., contiguous fenced area of Southern Exclosure and North Oso Flaco Exclosure) throughout this HCP's permit term, except for the removal of the exclosure fencing for East Boneyard (section 2.2.5.11). The size of the 6 Exclosure may also be reduced if the conditions described in section 5.2.3 are met. Nests that are found in the open riding area will be protected with single-nest exclosures (section 2.2.2.1.1). SNPL nests in South Oso Flaco are protected by symbolic fence and may also receive a 7-foot circular exclosure or mini exclosure.

Goal 2: Minimize conflicts between park users, park operations, and SNPL through a combination of education, avoidance and minimization measures, and enforcement of park rules and regulations.

Objective 2.1: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of SNPL, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

Objective 2.2: Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect SNPL and its habitat.

Objective 2.3: Implement recreation and other use restrictions to avoid and minimize take of SNPL.

Objective 2.4: Conduct all maintenance and other park operations in a manner that avoids and minimizes take of SNPL.

5.2.2 California Least Tern Goals and Objectives

As presented in section 3.3.1.4.1, monitoring programs from 2001 to 2023 indicate an increase of the CLTE population in the HCP area until 2006, then a relatively level value through 2023. Overall management actions directed towards enhancing CLTE reproduction have been successful. The following goals and objectives are based on maximizing the success of implemented conservation strategies employed in the HCP area to date. The overall biological goals of the HCP for CLTE are to minimize take to the maximum extent practicable and to promote the health and viability of CLTE populations both locally and range-wide. The specific biological goals and objectives that will be implemented to achieve these goals follow. AMMs (section 5.3.1.2) will play a key role in meeting the CLTE goals and objectives.

Goal 1: Continue to contribute to CLTE recovery locally and range-wide.

Objective 1.1: Maintain a 5-year running average of 35 breeding pairs of CLTE in the HCP area.

As described in the most recently completed USFWS 5-Year Review for CLTE, due to variable methodologies in estimating the number of CLTE pairs between nest sites and years, the estimated breeding population may not accurately reflect the actual size of the CLTE breeding population.

Regardless, data indicate the current U.S. CLTE population substantially exceeds the numeric goal of 1,200 breeding pairs in the 1985 Recovery Plan for downlisting and delisting, although it began a downward trend in 2010 (USFWS 2020a). Therefore, this objective for CLTE in the HCP area has been set at an achievable and sustainable number of breeding pairs based on the recent size of the population of CLTE breeding in the HCP area and inferred management potential based on the management actions implemented since 2001 (when the Southern Exclosure was first erected as far north as Post 7).

CLTE population sizes can exhibit large annual fluctuations, so the population size goal is based on a moving average across a 5-year window, rather than single annual population sizes. From 1998 to 2023, an average of 37 pairs of CLTE nested in the HCP area; however, numbers fluctuated greatly between 4 and 55 pairs.

Even at intensively managed sites such as the HCP area, large fluctuations in population size, such as between 1999 and 2000, indicate few CLTE may attempt to breed in some years and that after such occurrences it may take more than 1 year to return to previous numbers (Figure 3-4). Uncontrollable circumstances that could lead to low numbers of nesting CLTE include depleted food resources, a major population decline throughout the range, disease, or a shift of birds to another breeding area. Therefore, the status of the population will be assessed based on a 5-year running average of breeding pairs while considering demonstrated population fluctuations. Nevertheless, under the intensive management regime currently employed (and recommended for this HCP's conservation program) it should be possible for CDPR to sustain a 5-year running average of at least 35 CLTE breeding pairs, as this has been attained since the 2001–2005 5-year period, except for the 5-year average ending in 2013 (2009-2013), when it was 34 (Figure 3-6).

Objective 1.2: Maximize the reproductive success of CLTE in the HCP area to maintain a 3-year moving average of at least 0.8 fledglings per nesting pair.

Minimizing threats (e.g., predators, disturbance from park visitors) to nesting CLTE, eggs, and young is a critical component of the CLTE conservation program in the HCP area. Objective 1.2 is based in part on delisting criteria from the Recovery Plan for the CLTE (USFWS 1985), which states that "each of the 'secure' coastal management areas must have a 5-year mean reproductive rate of 1.0 fledged per breeding pair." However, reiterating recommendations made in 2006 (USFWS 2006), the 2020 5-Year Review for CLTE recommended revising and updating the 1985 Recovery Plan to address shortcomings including "further analysis of the fledgling per pair ratio," noting that "no consensus currently exists on what reproductive rate would be needed for a stable population size" (USFWS 2020a). As described in the 5-Year Review, the minimum CLTE fledge rate averaged 0.7 from 1984 to 2000, while the number of breeding pairs in the U.S. increased from approximately 1,000 to well over 4,500 in that same period. Despite the annual fledgling to nesting pair ratio not approaching 1.0 as called for in the 1985 Recovery Plan, the adult population of breeding CLTE has increased seven-fold since listing (USFWS 2020a). However, CLTE fledge rates have been declining more recently in the U.S., largely due to poor productivity of southern California colonies where the majority of the population breeds.

CDPR has thus elected to use the federal fledge rate delisting criterion as a starting point, modified to reflect site-specific data and conditions. Since 2001, management actions in the HCP area have been successful in elevating the number of breeding pairs and the number of chicks fledged per breeding pair, with the fledge rate first exceeding 1.0 young fledged per breeding pair in 2006 (Table 3-10). The 3-year running average remained above 1.0 in 12 of the 16 years from 2008-2023 and has consistently exceeded 0.8 in that timeframe (Figure 3-7). CDPR will continue to implement conservation actions to maintain a fledge rate of 0.8 fledged chicks per nesting pair. Should new, lower delisting criteria for number of fledged per breeding pair be issued with a new CLTE recovery plan, CDPR may adopt the new

delisting criteria[84], in consultation with USFWS, if fledge rates per breeding pair have consistently fallen below 0.8 in the HCP area.

CDFW has also recognized the need to identify the minimum fledgling to nesting pair ratio needed to sustain and increase populations (CDFW 2024). Determining the minimum fledge rate is only part of better understanding the factors affecting CLTE population stability and growth, which may include changing oceanic conditions affecting prey availability (CDFW 2024) and threats impacting the species on its wintering grounds and migration route (USFWS 2020a). Although CDPR cannot address these external population influences, efforts to improve water quality and quantity within the HCP area (see, e.g., CRLF Goal 3, below) may benefit CLTE foraging habitat, and in conjunction with the intensive management of CLTE breeding conditions, including habitat manipulation conducted when CLTE have left the site, will ensure the HCP area continues to be a secure site that well exceeds the minimum 20 pairs as listed in the 2020 5-Year Review Table 1 (USFWS 2020a).

Objective 1.3: Increase the habitat quality through habitat enhancement and restoration.

This objective is designed to maintain and improve habitats for nesting, resting, and foraging CLTE. Habitat enhancement and restoration has been successful in reclaiming CLTE habitat in other locations throughout California. Following the CLTE breeding season (i.e., between October and February), camping, street-legal vehicles, and OHVs are allowed in the Southern Exclosure area. Recreational use in this area may result in some areas of flattened terrain and barren sand with very limited, scattered debris and vegetation. Oceano Dunes SVRA staff place material in bare areas of the 6, 7, and 8 Exclosures to enhance CLTE breeding habitat and offer more areas of cover for CLTE that can provide shelter from wind and blowing sand, reduce exposure to predators, and augment potential nesting substrate. Habitat enhancement activities begin in February or March prior to nest initiation and consist of adding natural materials such as driftwood, woodchips, and wrack to the exclosures and shoreline. Habitat enhancement will not occur within 100 feet of the eastern exclosure fence that borders the open riding area in order to discourage CLTE from nesting near activities that could disturb breeding birds.

Dense vegetation has developed in the Southern Exclosure over more recent years, resulting in increasingly tall, vegetated hummocks and severe topography. Concurrently, nesting by CLTE in these areas shows a marked decrease. Although nests in dense vegetation are more difficult to locate, the lower nest numbers are likely due to the combination of substrate and viewshed not being appropriate for nesting and the large hummocks attracting avian predators as perch locations. As of 2023, approximately 25% of the acreage in 6, 7, and 8 Exclosures (roughly 40 acres mostly on the west side) has become less productive for CLTE, with nest numbers in this area having 7.6% of the total nests during the 2016 to 2020 period compared to only 1.4% since the year-round closure from 2021 to 2023.

Oceano Dunes SVRA staff will conduct habitat manipulation in the Southern Exclosure to reduce the density of vegetation, focusing on invasive species, and remove larger dune hummocks to maintain the characteristics of primary habitat as defined in sections 3.3.1.8 and 3.3.2.8 and indicated by breeding productivity. The intent will be to mimic the natural action of creek and river mouths, which can clear out acres of vegetation in one storm event to create “blow-out” areas within the foredune habitat, extremes for which foredune habitats are adapted. Only large hummocks will be targeted; small hummocks will be left in place, with a goal of creating a mosaic of plants and open sand areas attractive to CLTE for nesting and rearing chicks. Prior to any habitat manipulation, trained park staff will verify

[84] The criteria that must be met for CLTE to reduce the 6 Exclosure size (section 5.2.3) will not be changed even if CDPR adopts the new delisting criteria.

sensitive listed plant species and small mammal burrows are absent. A trained monitor will also be present during mechanical removal to ensure all wildlife remains safe and any sensitive plants are avoided. CDPR will continue to examine the condition of the topography and vegetation growing in the exclosure along with nesting outcomes and will update the approach to habitat management as new information becomes available.

Objective 1.4: Reduce predation.

Predators are one of the primary causes for the loss of CLTE adults, eggs, and chicks. This objective involves managing predator populations by deterring predators, relocating predators, and/or lethally removing predators to reduce predation on CLTE adults, juveniles, chicks, and eggs (section 2.2.2.1.2).

Objective 1.5: Reduce disturbance by recreational users and predators.

This objective involves using exclosures (section 2.2.2.1.1) to protect nesting CLTE, their nests, and chicks from predators and park users that may inadvertently or otherwise cause harm.

Virtually all CLTE nests at Oceano Dunes SVRA will receive some type of fence protection (generally, only those few nests that are not discovered by monitors do not receive some type of fence protection). CDPR will maintain the current relative size and configuration of the seasonal exclosure (i.e., contiguous fenced area of Southern Exclosure and North Oso Flaco Exclosure) throughout this HCP's permit term, except for the removal of the exclosure fencing for East Boneyard (section 2.2.5.11). The size of the Southern Exclosure will be increased to the extent bumpouts are needed to maintain a minimum 330-foot buffer between CLTE nests and areas open to the public, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. The size of the 6 Exclosure may be reduced if the conditions described in section 5.2.3 are met. Nests that are found in the open riding area will be protected with large single-nest exclosures (section 2.2.2.1.1).

Goal 2: Minimize conflicts between park users, park operations, and CLTE through a combination of education, avoidance and minimization measures, and enforcement of park rules and regulations.

Objective 2.1: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of CLTE, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

Objective 2.2: Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect CLTE and its habitat.

Objective 2.3: Implement recreation and other use restrictions to avoid and minimize take of CLTE.

Objective 2.4: Conduct all maintenance and other park operations in a manner that avoids and minimizes take of CLTE.

5.2.3 Changes to the 6 Exclosure for Western Snowy Plover and California Least Tern

The following criteria[85] for SNPL and CLTE must be met before the 6 Exclosure can be reduced in size (section 2.2.5.11):

[85] Criteria to reduce the 6 Exclosure were obtained from recommendations originally provided in (Page 2011). The SNPL population size criterion was based on the estimated management potential for SNPL in the HCP area section, but adjusted

- Breeding SNPL population size ≥ 180 for 3 consecutive years, including the year before the 6 Exclosure is reduced in size (SNPL Objective 1.1).
- SNPL fledge rate ≥ 1.0 fledglings per male for same 3 consecutive years, including the year before the 6 Exclosure is reduced in size (SNPL Objective 1.2).
- Breeding CLTE population size ≥ a 5-year running average of 35 nesting pairs,[86] including the year before the 6 Exclosure is reduced in size.
- CLTE fledge rate averages ≥ 1.0 fledglings per pair[87] over the same 5 consecutive years, including the year before the 6 Exclosure is reduced in size.

To date, no changes in the 6 Exclosure size have occurred. At this time, the criterion for SNPL population size has been met consistently from 2014 to 2023; the criterion for SNPL fledge rate criterion has been met consistently from 2013 to 2018 and 2020 to 2023; the CLTE population size criterion was met consistently from 2012 to 2017 and 2020 to 2023; and the CLTE fledge rate criterion was met from 2006 to 2011, 2013 to 2016, and 2018 to 2019, but dropped below 1.0 fledglings per pair in 2012 and well below 1.0 fledglings per pair in 2017. From 2020 to 2023, the minimum fledglings per pair ranged from 0.83-0.9.

If these conditions are met in the future, the 6 Exclosure may, at CDPR's discretion, be reduced cautiously in annual 328-foot increments[88] (section 2.2.5.11). This increment represents approximately 12 percent of the current total length of the 6 Exclosure, ensuring that while the new area kept open to recreation each year provides a meaningful change in shoreline available to visitors, it is still small enough to be closely monitored for potential conflict. Subsequent to the 6 Exclosure reduction, if the remaining protected area fails to meet the criteria listed above for either species, the 6 Exclosure will be restored in the following breeding season in consultation with the USFWS. Decisions to restore the 6 Exclosure fence to ensure the criteria are met will be based on the best available science and could include additional management actions (e.g., predator management) in addition to restoring the fence size. The 6 Exclosure will be restored to its full extent if the criteria are not met. However, if the protected area criteria listed above are met in subsequent years for both species, then the fencing may once again begin to be reduced in 328-foot increments so that, if criteria listed above are sustained over the requisite number of seasons, the entire approximately 60-acre 6 Exclosure fence may ultimately be removed.

CDPR will reduce 6 Exclosure at its discretion (and by the allowed rates) based on factors including, but not limited to:

- CDPR confirmation that targets have been achieved
- Operational considerations/Environmental safeguards

upward to reflect more recent increased breeding success (5.2.1). The SNPL fledge rate criterion was based on the USFWS recovery plan estimate for the number of fledged young per breeding male necessary for population stability. The CLTE population size criterion is based on average numbers of CLTE considered possible to maintain based on past numbers of CLTE present in the HCP area. The CLTE fledge rate criterion is based on past estimates of CLTE fledglings per pair in the HCP area and as a number that is more than adequate for population growth.

[86] CLTE breeding numbers are calculated as a range. This number will be based on the lowest number in the range.

[87] CLTE breeding numbers are calculated as a range; therefore, fledging rates are also calculated using a range. This number will be based on the lowest number in the range.

[88] As noted in section 2.2.5.11, CDPR may implement alternative incremental reductions, such as by adjusting the eastern fence, to better suit SNPL and CLTE management.

- Biological considerations
- Programmatic considerations

5.2.4 Southwestern Pond Turtle Goals and Objectives

Throughout its range, factors associated with declining SWPT populations include anthropogenic direct habitat loss and fragmentation, altered hydrology, introduced predators, introduced competitors (especially red-eared sliders), and climate change (USFWS 2023c). Recreation can harm SWPT, including via direct mortality, habitat degradation, and disturbance, but is not deemed to generally cause significant impacts to SWPT (USFWS 2023c). For SWPT in the HCP area, non-management take that might occur will result from disturbance, direct harm or capture, and habitat loss or damage due to recreation and park operations and management. The full extent of SWPT occupancy and population size in the HCP area is not yet known. For this species, the conservation program will include a combination of expanding CDPR understanding of SWPT populations along with take AMMs, habitat restoration/enhancement to increase populations and improve habitat quality within the HCP area, and invasive predator removal. Biological goals and objectives for SWPT were developed using ecological life history and natural community descriptions.

The conservation program emphasizes protecting and enhancing SWPT aquatic and upland habitat to maintain or increase populations. Habitat will be protected from park visitors and park staff activities, invasive predators will be controlled, and aquatic vegetation will be managed to improve habitat. AMMs (section 5.3.1.3) will play a key role in meeting the SWPT goals and objectives.

Goal 1: Expand understanding of SWPT population status and trends within the HCP area.

Objective 1.1: Identify and assess the status of SWPT within known occupied and potential habitat.

Objective 1.2: Refine understanding of threats to SWPT from covered activities and opportunities for habitat enhancement.

Goal 2: Minimize the effects of park operations, visitor activities, and management activities on SWPT and suitable SWPT habitat.

Objective 2.1: When necessary to limit substantial encroachment that could significantly degrade suitable SWPT habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential SWPT habitat.

Objective 2.2: Protect habitat by closing informal trails adjacent to occupied aquatic habitat.

Objective 2.3: Park operations and management will be carried out in a manner that avoids and minimizes effects on SWPT habitat.

Objective 2.4: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of SWPT, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

Goal 3: Improve habitat quality by managing invasive predators and enhancing site conditions for all SWPT life stages.

Objective 3.1: Control invasive aquatic predators/competitors of SWPT.

Invasive predators prey upon multiple SWPT life stages (e.g., hatchlings, juvenile) (Jennings and Hayes 1994), and competition with non-native predators may adversely affect SWPT occupancy and behavior (USFWS 2023a). Populations of native predators such as raccoons, which prey on all SWPT life stages including eggs and adults, that are supplemented by trash and other food sources can threaten viability of SWPT populations, especially if habitat is already limited (USFWS 2023a).

Invasive SWPT predators/competitors, including e.g., red-eared sliders, bullfrogs, and bass, have been found in the HCP area in locations such as Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, and Oso Flaco Lake. CDPR will monitor and control populations of invasive predators/competitors as funding and staff resources allow, focusing efforts on bullfrogs in locations where invasive species pose the greatest or immediate threat to SWPT. CDPR will also specifically remove bullfrogs to offset incidental take as described in section 5.3.2.1.2. CDPR will work towards control and containment of invasive species under this HCP as eradication will not be possible. Predator/competitor removal will be quantified to allow Natural Resource staff to evaluate the effects of predator/competitor removal and determine how best to focus such efforts.

CDPR will remove non-native predators (i.e., bullfrog, red-eared slider, crayfish, non-native warm water fish) when they are encountered during normal fisheries and herpetological surveys. To fully offset the requested take of SWPT, CDPR will specifically remove bullfrog from priority habitats for each adult, juvenile, or hatchling SWPT that is killed or injured as part of this HCP. When possible, injured SWPT and eggs will be transferred to a wildlife rehabilitation facility. See section 5.3.2.1.2 for a description of this offset.

Objective 3.2: Enhance SWPT habitat by managing and restoring aquatic and upland site conditions.

Eradicating or reducing the cover, biomass, and distribution of non-native invasive plants will enhance SWPT habitat for foraging, basking, nesting, and movement. Some sites may benefit from planting or thinning native aquatic and upland species. Data developed under Objective 1.2 will allow CDPR to prioritize locations, species, and methodologies for control and enhancement. CDPR will also restore and manage dune slack wetland as described in section 5.3.2.1.2.

Goal 4: Minimize upstream water quality and quantity effects on SWPT and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objective 4.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area, whose activities affect water quality and quantity in the HCP area, and the Regional Water Quality Control Board (RWQCB).

Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds. Urbanization and agricultural activities upstream of the HCP area influence water quality and quantity in the HCP area's streams and lakes. In addition to modifying water quantity, land use practices can impact water quality, which in turn may have negative effects on habitats downstream. Impacts include changes in sediment load and concentrations of nutrients, salts, metals, and agrochemicals, the influx of pathogens, and a change in the temperature regime.

Draw-down of water levels upstream of the HCP area can impact populations of species downstream. Monitoring described in sections 5.4.2.2 and 5.4.2.3 will allow CDPR to determine if SWPT habitat quantity or quality is compromised. Where the cause of impacts to water flows or quality is outside of CDPR control, CDPR will work with off-site landowners as feasible (with support from USFWS) to provide suitable aquatic SWPT habitat.

CDPR will notify appropriate federal and state authorities immediately upon observation of upstream disturbance (unnatural dewatering of stream, illegal dumping or waste discharge, etc.) if it appears that the disturbance is having or potentially could have a detrimental impact to SWPT.

CDPR will work through existing and future stakeholder groups to secure a reliable supply of surface water to support SWPT. This effort will be focused on sustainable groundwater use. CDPR will also participate in ongoing regional efforts to manage surface water in Arroyo Grande Creek to advocate for continued water supply at the estuary. If a watershed assessment or other watershed-based program commences that could help the watershed as a whole, then CDPR will evaluate participation in such a program.

5.2.5 California Red-Legged Frog Goals and Objectives

Throughout its range, factors associated with declining CRLF populations include degradation and loss of habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, invasive plants, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators. The reason for the decline and degree of threats vary by geographic location (USFWS 2002). For CRLF in the HCP area, take that might occur will result from habitat disturbance or destruction due to public encroachment and park operations and management. For this species, the conservation program will include a combination of take AMMs (section 5.3.1.4), habitat restoration to increase populations and improve habitat quality within the HCP area, and invasive predator control. Biological goals and objectives for CRLF were developed using ecological life history and natural community descriptions and CRLF management recommendations in the federal Recovery Plan (USFWS 2002).

The conservation program emphasizes protecting and enhancing CRLF aquatic and upland habitat to maintain or increase populations. Habitat will be protected from park visitors and park staff activities, invasive predators will be controlled, and aquatic vegetation will be managed to improve habitat. AMMs (section 5.3.1.4) will play a key role in meeting the CRLF goals and objectives.

Goal 1: Minimize the effects of park operations, park visitor activities, and management activities on suitable CRLF habitat.

Objective 1.1: When necessary, to limit substantial encroachment that could significantly degrade suitable CRLF habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential CRLF habitat.

Objective 1.2: Protect habitat by closing informal trails adjacent to occupied aquatic habitat.

Objective 1.3: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of CRLF, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

Goal 2: Improve habitat quality by managing invasive predators and enhancing suitable habitat for all CRLF life stages.

Objective 2.1: Control invasive aquatic predators of CRLF.

Invasive predators prey upon multiple CRLF life stages (e.g., egg, tadpole, adult) and can have a large impact on a population (USFWS 2002). Invasive predators of CRLF, including bullfrogs, mosquitofish, largemouth bass, and crayfish, have been found in the HCP area in locations such as Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, and Oso Flaco Lake. CDPR will monitor and control populations of invasive predators as funding and staff resources allow, focusing efforts first on locations where invasive predators pose the greatest or immediate threat to CRLF. CDPR will work towards control and containment of invasive species under

this HCP as eradication will not be possible. Predator removal will be quantified to allow Natural Resource staff to evaluate the effects of predator/competitor removal and determine how best to focus such efforts.

CDPR will remove non-native predators (i.e., bullfrog, red-eared slider, crayfish, non-native warm water fish) when they are encountered during normal fisheries and herpetological surveys. To fully offset the requested take of CRLF, CDPR will restore dune slack wetland, including monitoring for and controlling invasive predators (i.e. bullfrog, red-eared slider, non-native warm water fish, crayfish). See section 5.3.2.1.2 for a description of this offset.

Objective 2.2: Enhance CRLF habitat by restoring and managing aquatic and upland site conditions.

CDPR will restore and manage dune slack wetland as described in section 5.3.2.1.2. Management of the newly restored habitat will include invasive predator management.

Additionally, CDPR will enhance CRLF habitat by eradicating or reducing the cover, biomass, and distribution of non-native invasive plants. Species needing control efforts in the HCP area include Cape ivy, Boston ivy, pampas grass, poison hemlock, and Italian thistle. The aggressive growth pattern of all these species will eventually displace even the most established native plant community. Routine vegetation management currently occurs at Oso Flaco area, Oceano Lagoon and Lagoon Trail, Meadow Creek, and Pismo Lake spillway. Other areas that may need vegetation management include Arroyo Grande Creek and Estuary, and dune lakes and wetlands. Breeding adults are often associated with dense, shrubby riparian or emergent vegetation and areas with deep (>27 inches), still, or slow-moving water (USFWS 2001a, Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii) 2002). Besides control of invasive plant species, vegetation management often includes removal of emergent vegetation and debris, as aquatic areas become choked with vegetation making it inhospitable for CRLF.

Goal 3: Minimize upstream water quality and quantity effects on CRLF and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objective 3.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area, whose activities affect water quality and quantity in the HCP area, and RWQCB. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.

Urbanization and agricultural activities upstream of the HCP area influence water quality and quantity in the HCP area's streams and lakes. In addition to modifying water quantity, land use practices can impact water quality, which in turn may have negative effects on habitats downstream. Impacts include changes in sediment load and concentrations of nutrients, salts, metals, and agrochemicals, the influx of pathogens, and a change in the temperature regime. A decrease in water quality can adversely affect CRLF and other native wetland species (USFWS 2002).

Draw-down of water levels upstream of the HCP area can impact populations of species downstream. Monitoring described in sections 5.4.3.2 and 5.4.3.3 will allow CDPR to determine if CRLF habitat quantity or quality is compromised. Where the cause of impacts to water flows or quality is outside of CDPR control, CDPR will work with off-site landowners as feasible (with support from USFWS) to provide suitable aquatic CRLF habitat.

CDPR will notify appropriate federal and state authorities immediately upon observation of upstream disturbance (unnatural dewatering of stream, illegal dumping or waste discharge, etc.) if it appears that the disturbance is having or potentially could have a detrimental impact to CRLF.

CDPR will work through existing and future stakeholder groups to secure a reliable supply of surface water to support CRLF. This effort will be focused on sustainable groundwater use. CDPR will also participate in ongoing regional efforts to manage surface water in Arroyo Grande Creek to advocate for

continued water supply at the estuary. If a watershed assessment or other watershed-based program commences that could help the watershed as a whole, then CDPR will evaluate participation in such a program.

5.2.6 Western Spadefoot Goals and Objectives

Throughout its range, factors associated with declining WSF populations include anthropogenic direct habitat loss and degradation (e.g., from fragmentation), introduced predators, disease, wildfire, chemical contaminants, noise disruption, and climate change, with habitat effects and climate change being the greatest threat to species viability (USFWS 2023d). For WSF in the HCP area, non-management take that might occur will result from disturbance, direct harm or capture, and habitat loss or damage due to recreation and park operations and management. Covered species management take will include capture and possible mortality or injury during monitoring that will be covered through the USFWS Recovery Permit. The full extent of WSF occupancy and population size in the HCP area is not yet known. For this species, the conservation program will include a combination of expanding CDPR understanding of WSF populations along with take AMMs, habitat restoration/enhancement to increase populations and improve habitat quality within the HCP area, and invasive predator control. Biological goals and objectives for WSF were developed using ecological life history and natural community descriptions.

The conservation program emphasizes protecting and enhancing WSF aquatic and upland habitat to maintain or increase populations. Habitat will be protected from park visitors and park staff activities, invasive predators will be controlled, and aquatic vegetation will be managed to improve habitat. AMMs (section 5.3.1.5) will play a key role in meeting the WSF goals and objectives.

Goal 1: Expand understanding of WSF population status and trends within the HCP area.

Objective 1.1: Identify and assess the status of WSF within known occupied and potential habitat.

Objective 1.2: Refine understanding of threats to WSF from covered activities and opportunities for habitat enhancement.

Since not much is known about the breeding habitat or distribution of WSF within the HCP area, more information is needed to better refine the potential for harm from covered activities. Priority will be given to known or potential breeding locations to better assess how covered activities will impact these habitats. No impacts to WSF have been noted over decades of operations within the HCP area. As more information is available about the status and distribution of this species in the HCP area, additional protective measures will be identified and implemented.

Goal 2: Minimize the effects of park operations, visitor activities, and management activities on suitable WSF habitat.

Objective 2.1: When necessary to limit substantial encroachment that could significantly degrade suitable WSF habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential WSF habitat.

Objective 2.2: Protect habitat by closing informal trails adjacent to occupied aquatic habitat.

Objective 2.3: Park operations and management will be carried out in a manner that avoids and minimizes effects on WSF habitat.

Objective 2.4: As applicable, provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of WSF, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring

efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

Goal 3: Improve habitat quality by managing invasive predators and enhancing suitable habitat for all WSF life stages.

Objective 3.1: Control invasive aquatic predators of WSF.

Invasive predators prey upon multiple WSF life stages (e.g., egg, tadpole, adult) (Jennings and Hayes 1994). Invasive predators of WSF, including bullfrogs, mosquitofish, largemouth bass, and crayfish, have been found in the HCP area in locations such as Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, and Oso Flaco Lake. CDPR will monitor and control populations of invasive predators as funding and staff resources allow, focusing efforts first on locations where invasive predators pose the greatest or immediate threat to WSF. CDPR will work towards control and containment of invasive species under this HCP as eradication will not be possible. Predator removal will be quantified to allow Natural Resource staff to evaluate the effects of predator/competitor removal and determine how best to focus such efforts.

CDPR will remove non-native predators (i.e., bullfrog, red-eared slider, crayfish, non-native warm water fish) when they are encountered during normal fisheries and herpetological surveys. To fully offset the requested take of WSF, CDPR will restore dune slack wetland, including monitoring for and controlling invasive predators (i.e. bullfrog, non-native warm water fish, crayfish). See section 5.3.2.1.2 for a description of this offset.

Objective 3.2: Enhance WSF habitat by restoring and managing aquatic and upland site conditions.

CDPR will restore and manage dune slack wetland as described in section 5.3.2.1.2. Management of the newly restored habitat will include invasive predator management.

Additionally, CDPR will enhance WSF breeding habitat by eradicating or reducing the cover, biomass, and distribution of non-native invasive plants. Non-native and even overly abundant native vegetation can degrade breeding habitat by intruding into ponded areas clogging them with vegetation and even causing the pools to dry out too fast for successful WSF breeding (USFWS 2023b). Data developed under Objective 1.2 will allow CDPR to prioritize locations, species, and methodologies for control and enhancement.

Goal 4: Minimize upstream water quality and quantity effects on WSF and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objective 4.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area, whose activities affect water quality and quantity in the HCP area, and RWQCB. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.

Urbanization and agricultural activities upstream of the HCP area influence water quality and quantity in the HCP area's streams and lakes. In addition to modifying water quantity, land use practices can impact water quality, which in turn may have negative effects on habitats downstream. Impacts include changes in sediment load and concentrations of nutrients, salts, metals, and agrochemicals, the influx of pathogens, and a change in the temperature regime.

Draw-down of water levels upstream of the HCP area can impact populations of species downstream. Monitoring described in sections 5.4.4.2 and 5.4.4.3 will allow CDPR to determine if WSF habitat quantity or quality is compromised. Where the cause of impacts to water flows or quality is outside of CDPR control, CDPR will work with off-site landowners as feasible (with support from USFWS) to secure sufficient water and appropriate water quality for WSF on HCP covered lands.

CDPR will notify appropriate federal and state authorities immediately upon observation of upstream disturbance (unnatural dewatering of stream, illegal dumping or waste discharge, etc.) if it appears that the disturbance is having or potentially could have a detrimental impact to WSF.

CDPR will work through existing and future stakeholder groups to secure a reliable supply of surface water to support WSF. This effort will be focused on sustainable groundwater use. CDPR will also participate in ongoing regional efforts to manage surface water in Arroyo Grande Creek to advocate for continued water supply at the estuary. If a watershed assessment or other watershed-based program commences that could help the watershed as a whole, then CDPR will evaluate participation in such a program.

5.2.7 Tidewater Goby Goals and Objectives

Throughout its range, factors associated with declining populations of tidewater goby include modification and loss of habitat as a result of coastal development, channelization of habitat, diversions of water flows, groundwater overdraft, and other alteration of water flows. Potential threats to the tidewater goby include discharge of agricultural and sewage effluents, increased sedimentation due to cattle grazing and feral pig activity, summer breaching of lagoons, upstream alteration of sediment flows into the lagoon areas, introduction of invasive species, habitat damage, and watercourse contamination resulting from vehicular activity in the vicinity of lagoons (USFWS 2005a). Biological goals and objectives for tidewater goby were developed using ecological life history and natural community descriptions (Chapter 3) and management recommendations for tidewater goby in the final federal Recovery Plan (USFWS 2005a) and the USFWS 5-year review (USFWS 2007b).

For tidewater goby, the conservation program emphasizes protecting the existing populations at Arroyo Grande Creek and Estuary and Pismo Creek Lagoon. Habitat will be protected from park visitors and park staff activities, invasive predators will be controlled, and attempts will be made to influence better management of water supply and quality to improve habitat, as feasible. For tidewater goby in the HCP area, take that might occur will result from habitat disturbance or destruction due to public encroachment and park operations and management. AMMs thus play an important role in the conservation program for tidewater goby (section 5.3.1.6).

Goal 1. Minimize the effects of park operations, park visitor activities, and management activities on tidewater goby habitat.

Objective 1.1: Protect tidewater goby habitat by closing informal trails in and adjacent to occupied and potential habitat.

Objective 1.2: Protect tidewater goby habitat in Arroyo Grande Creek and Estuary by enforcing crossing guidelines.

Objective 1.3: Protect tidewater goby habitat in Pismo Creek Lagoon by pursuing installation of proposed improvements to Pismo Creek.

CDPR commissioned a study to investigate the critical issues affecting the Pismo Creek Lagoon and to consider alternatives for improvement that will be supported by stakeholders (CSLRCD 2011). A few of the proposed improvements that were acceptable to all stakeholders, including permitting agencies, included barrier dune stabilization, a floating pedestrian bridge, and creek bank stabilization and habitat improvement. Oceano Dunes SVRA will pursue the installation of proposed improvements suggested by the Coastal San Luis Resource Conservation District over the course of the permit term. These include barrier dune stabilization, a floating pedestrian bridge, and creek bank stabilization and habitat improvement. The floating bridge is already a covered activity (section 2.2.5.1). Some of these activities, including creek bank stabilization, may face Coastal Act or other permitting challenges outside of CDPR control.

Objective 1.4: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of tidewater goby, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

Goal 2: Manage non-native plants and animals to protect all life stages of tidewater goby.

Objective 2.1: Control invasive aquatic predators of tidewater goby and other invasive species that reduce tidewater goby habitat quality.

When an invasive fish is introduced, whether intentional or accidental, potential negative consequences include suppression of native fish populations through competition, predation and/or hybridization, and disruptions to habitats and ecosystem function. In general, there are three options for management of invasive fishes: no action, control and containment of the species within defined spatial areas, and eradication. There may also be instances where an invasive species is actively spread or populations are enhanced for a variety of legal and unregulated purposes related to their economic and/or social benefits and irrespective of their impacts in the environment (e.g., mosquitofish for mosquito control). With the Meadow Creek flood gates periodically releasing freshwater and periodically allowing invasive fish species into the Arroyo Grande Creek and Estuary, CDPR will work towards control and containment of invasive species under this HCP as eradication will not be possible. CDPR will thus need to work with the operator of the floodgates (San Luis Obispo County Public Works) to develop operations and maintenance plans that protect the habitat values in the Arroyo Grande Creek and Estuary. That could mean control of invasive fish and other activities that will protect native fish (goby and steelhead) and CRLF.

Although CDPR is not directly responsible for impacts associated with invasive species found within Pismo and Arroyo Grande Creeks, continuing management shall take place in an effort to control invasive predators. Since 2003, numerous invasive fish species have been observed within Arroyo Grande Creek and Estuary, including mosquitofish, largemouth bass, and various other sunfishes (Rischbieter 2008, 2018). The impact of these invasive species on tidewater goby is unknown but is presumed to have been periodically significant in Carpenter Creek. Consequently, CDPR will continue to monitor populations of these invasive predators and implement several management measures to provide additional protection to aquatic resources, including tidewater goby.

CDPR will continue the ongoing practice of removing non-native fish and other predators when they are encountered during normal tidewater goby surveys. To fully offset the requested take of tidewater goby, CDPR will remove key predators (i.e. bullfrog, non-native warm water fish) or crayfish from priority habitats for each individual tidewater goby that is incidentally taken from covered activities. See Section 5.3.2.1.4 for a description of this offset.

Goal 3: Minimize the effects of upstream water quality and quantity disturbances on tidewater goby and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners and water agencies.

Objective 3.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area, working in conjunction with local water agencies and the RWQCB.

Upstream of the HCP area, agriculture plays a large role in water quality and quantity in the streams and lakes of the watershed. In addition to modification of the hydroperiod, land use practices can have important impacts on water quality, which in turn may have negative or, in some cases, positive effects on downstream uses of water. Impacts include changes in sediment load and concentrations of nutrients, salts, metals, and agrochemicals, the influx of pathogens, and a change in the temperature

regime. A decrease in water quality can impact native fisheries and other aquatic vertebrates. A CDPR representative will continue to work with conservation partners and agency staff to focus on watershed restoration in the Arroyo Grande Creek, Pismo Creek, and Oso Flaco watersheds. These efforts are largely focused on sustainable habitat, water quality, and water quantity and will benefit numerous aquatic species, including tidewater goby and CRLF.

Additionally, CDPR will work through existing and future stakeholder groups to secure a reliable supply of surface water to support tidewater goby in Arroyo Grande Creek and Estuary. This effort will be focused on sustainable and coordinated groundwater use, especially in the lower portion of the Arroyo Grande Creek watershed (Cienega Valley). CDPR will also participate in ongoing regional efforts to manage surface water in AG Creek to advocate for continued water supply at the estuary.

Goal 4: Evaluate the suitability of potential tidewater goby habitat in the HCP area.

Objective 4.1: Cooperate with USFWS efforts to evaluate habitat conditions of other potential tidewater goby habitat within the HCP area.

The tidewater goby recovery plan identifies Oso Flaco Lake as a potential tidewater goby introduction location, and Oso Flaco Lake is designated as critical habitat (USFWS 2005a). CDPR is not proposing goby introduction as part of this HCP. CDPR will, however, assist USFWS with data collection in Oso Flaco Lake or other potential tidewater goby habitat.

5.2.8 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress Goals and Objectives

Range-wide factors associated with declining populations of marsh sandwort, La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo Mesa lupine, and Gambel's watercress include habitat degradation or destruction, adverse effects from biostimulation, and competition with invasive species for light, water, nutrients, and space. Other threats include the occurrence of sudden disastrous events due to the small size and isolation of the remaining population, and in the case of Gambel's watercress, biological and genetic factors such as genetic swamping from the closely related, introduced species, common watercress.

The conservation program emphasizes protecting the existing populations within the HCP area. Habitat will be protected from park visitors and park staff activities, invasive species will be controlled, habitats will be restored, and CDPR will work with landowners upstream to improve water quality. Impacts occurring to these species in the HCP area are through public encroachment and park operations and management in occupied habitat. AMMs thus play an important role in the conservation program for these species. The primary focus is to avoid or minimize impacting individuals of each covered species and of high-quality habitat, such as fragile dunes, that may be affected by covered activities.

Goal 1. Protect and enhance habitat for marsh sandwort, La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo Mesa lupine, and Gambel's watercress within the HCP area to sustain or increase their populations.

Objective 1.1: Restore listed plant habitat.

A program to restore La Graciosa thistle, beach spectaclepod, and surf thistle habitat that includes seeding and planting of native foredune and dune scrub vegetation is currently being conducted by CDPR (CDPR 2024c). A program of selective propagation of specific plant species to augment existing populations and adjacent unoccupied habitats may be developed if monitoring shows that CDPR or public activities are negatively impacting individuals or populations. CDPR will monitor the propagation of listed plant species and their habitats for the life of the permit (section 5.4.6).

Objective 1.2: Protect listed plants from public encroachment.

Because La Graciosa thistle critical habitat has been designated (USFWS 2009c) in the vegetation islands within the open riding area, should La Graciosa thistle be found to occur within the vegetation islands, these individuals will be fenced and protected from public encroachment. Other listed plants will be protected from public encroachment using fencing, as necessary.

Objective 1.3: Close informal trails in and adjacent to listed plant species habitats and restore to original conditions.

Objective 1.4: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of the listed plants, the significance of the HCP area habitats for these species and their recovery, the importance of CDPR's protection and monitoring efforts, the impacts of invasive plants on these species, and the importance of working together to conserve these species and their habitat.

Goal 2: Manage invasive plants to protect listed plant species habitat.

Objective 2.1: Control non-native invasive plant species given that invasions of non-native plants create a serious threat to ecosystem function, native biological diversity, and many listed plant species.

Goal 3: Minimize upstream water quality effects on marsh sandwort and Gambel's watercress and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objective 3.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.

Goal 4: Collaborate with external agencies and institutions to propagate and outplant listed plants to HCP area lands.

Objective 4.1: Coordinate with USFWS and other agencies and institutions to explore opportunities for propagation and outplanting of listed plants in the HCP area to enhance existing populations and to support new populations of listed plant species in currently unoccupied but suitable habitat.

5.3 Avoidance, Minimization, and Mitigation Measures

CDPR's primary objective will continue to be avoidance and minimization of take of listed species. In addition, Section 10(a)(2)(A) of FESA requires that an HCP specify the measures that the permittee will undertake to minimize and mitigate to the maximum extent practicable the impacts of the take. This HCP adheres to CDPR's objective and FESA's hierarchical requirement to first implement avoidance and minimization and then, if necessary, implement mitigation measures (section 5.3.2).

5.3.1 Measures to Avoid and Minimize Impacts

The following tables describe the existing and new AMMs for each species. Each species' AMMs are then sorted according to the covered activities described in section 2.2. Many of these AMMs also reduce the impacts of recovery activities that are authorized in the USFWS 10(a)(1)(A) Recovery Permit (Appendix D).

5.3.1.1 Western Snowy Plover

The majority of AMMs for SNPL are part of the ongoing SNPL and CLTE management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, CDPR UAS use), and the AMMs for these activities are new as well. The table below lists the AMMs that will reduce potential effects from covered activities for SNPL (section 4.3.1). Covered activities that do not have effects on SNPL are not listed in the table.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
Park Visitor Activities: Motorized Recreation (CA-1)	
Potential Effects: Adults/juveniles/chicks struck by vehicles; Breeding/foraging/roosting disturbance; Chicks separated from adult(s) and inadequately attended or exposed to predation/inclement weather; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Chicks/eggs abandoned when adults are disturbed, killed, or injured; Eggs crushed.	
Avoidance and Minimization Measures	
AMM 1	CDPR will continue to create educational content on the Oceano Dunes SVRA and Pismo State Beach websites that includes life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well.
AMM 2	Signs explaining SNPL natural history and protection measures in place in the HCP area will continue to be posted for information and education of visitors in the HCP area. Interpretive panels at beach access points (e.g., Sand Highway, Oso Flaco Lake, Pier Avenue, and Grand Avenue) and signs identifying closed areas will continue to be erected to increase public awareness of threats to nesting SNPL and to inform the public of the park's management efforts to protect special-status species. Information on SNPL will also continue to be posted on the Oceano Dunes SVRA and Pismo State Beach websites and social media accounts.
AMM 3	CDPR will continue to enforce resource protection regulations. All exclosed and symbolically fenced areas will continue to be posted with signs in English and Spanish. State Park rangers will continue to have the responsibility to enforce park regulations enacted to protect SNPL, including issuing citations for incidents of trespass into the area closed for nesting. In addition, resource staff monitors will continue to contact visitors who violate park regulations and, where appropriate, contact rangers who will issue a citation.
AMM 4	Posted speed limits will continue to be enforced throughout the HCP area.
AMM 5	CDPR will continue to fence off the Southern Exclosure and North Oso Flaco Exclosure during the breeding season (March 1 through September 30) to limit vehicle and human disturbance to SNPL nesting areas (and to protect SNPL from terrestrial predators). The 48-acre foredune area is closed to the public when SNPL nests or broods are present, including the shoreline and western portions of the alleyways between plots.
AMM 6	A buffer zone a minimum of 100 feet that prohibits camping or parking vehicles will be established outside and around areas closed for nesting (e.g., Southern Exclosure, single-nest exclosures, bumpouts) and for nests found in the 48-acre foredune or vegetation islands.
AMM 7	Habitat enhancement will continue to be avoided within 100 feet of the fence that borders the open riding area to discourage nesting near recreation that may cause disturbance to breeding birds.
AMM 8	Daily monitoring will continue to take place during and immediately after the SNPL breeding season (when seasonal exclosure fencing is removed) to enable better identification of potential human use-related threats to SNPL and to summon law enforcement assistance, if needed, to prevent or eliminate any human use-related threats to the species.
AMM 9	If a SNPL is found injured or dead, USFWS and CDFW will be notified within 24 hours of finding the bird, with details of the event sent in email within 3 working days.
AMM 10	The open riding area will continue to be inspected a minimum of once per day during the breeding season, and daily or as staff levels and weather conditions allow during the non-breeding season to identify SNPL individuals and nests. All SNPL tracks in the riding area will continue to be followed to check for potential nests, and any SNPL breeding activity in the riding area (e.g., scrapes or pairs observed) will continue to be monitored closely. These areas will continue to be mapped and rechecked during the day, and one person will continue to be assigned each morning to recheck any potential breeding areas. Any nest found will continue to be protected with a large single-nest (i.e., minimum 100-foot radius) exclosure to protect nests from people and predators, as determined to be necessary.
AMM 11	If an SNPL nest is established within the open riding area, but close to the existing Southern Exclosure (e.g., 150 feet away), fencing will continue to be erected as necessary to enlarge the exclosure to encompass the nest site (if topography allows and if safe public traffic patterns are available). Fencing will continue to be placed a minimum of 100 feet from the nest site.
AMM 12	When two or more SNPL nests in the open riding area are located within 200 feet of each other and are not adjacent to the Southern Exclosure, they will continue to be encompassed into a new large temporary exclosure if topography allows. Fencing for such temporary exclosures will continue to be maintained a minimum distance of 100 feet from the nest site.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
AMM 13	If an SNPL nest is initiated inside the Southern Exclosure and close to the exclosure fence bordering the riding area, or inside any area closed to vehicles (e.g., vegetation island, 48-acre foredune), CDPR staff will continue to install additional fencing (i.e., "bumpout") to maintain a perimeter of a minimum of 100 feet from the open riding and camping area to the nest. These bumpouts will continue to be monitored regularly. If an incubating bird is disturbed by normal recreational activity, the bumpout will be increased in size, as needed. All nests are monitored for disturbance, and any nest that is disturbed by regular recreation activity may receive a bumpout. This additional fencing will continue to remain in place during the period when nests are active or chicks are found in this area. Once chicks move out of the area or reach fledge age, the bumpouts will be removed.
AMM 14	Circular nest exclosures will continue to be used, if deemed necessary by staff, for SNPL nest protection. These exclosures are constructed using 2-inch by 4-inch wire non-climb fence, and 0.5-inch by 0.5-inch mesh netting is placed on top. The exclosures are secured with metal posts. Circular exclosures have a diameter of 7 feet. When appropriate, they are buried 8 inches deep.
AMM 15	Mini exclosures measuring approximately 3 feet by 3 feet by 3 feet will continue to be used in the HCP area. These are constructed with 2-inch by 4-inch wire non-climb fence with a top of the same material. When appropriate, they are buried 4–8 inches deep. CDPR may use additional mini exclosures, experimenting with different size, orientation, and/or material as new information becomes available on mini exclosures from other sites.
AMM 16	At least one CDPR vehicle or trailer will continue to be available throughout the SNPL breeding season to carry all tools and equipment necessary to immediately construct a single-nest exclosure or bumpout.
AMM 17	Prior to a known nest hatching outside a seasonal exclosure or within an area open to motor vehicles (e.g., open riding area, vegetation islands), monitors will continue to oversee the erection of signs and/or temporary fencing to provide a safe passage until the brood reaches a non-vehicle use area of Oceano Dunes SVRA with a closed adjacent shoreline (i.e., Southern Exclosure). Fencing will extend to the surf line, if chick travel corridors establish that need. For nests hatching from areas outside but adjacent to the Southern Exclosure shoreline, fencing will be connected to the exclosure to allow for a contiguous temporary closed shoreline area. In addition, temporary small mesh fencing will be installed around the nest prior to hatching as necessary to protect chicks during the night. Qualified biologists/Natural Resource staff will continue to follow the broods if a brood is observed leaving the single-nest exclosure, to identify threats to brood movement or safety, redirect any vehicle or pedestrian traffic, and to obtain assistance as necessary from Oceano Dunes SVRA patrol staff. This additional fencing will continue to remain in place during the period when nests are hatching or chicks are present in the closed shoreline area. Once chicks move out of the area or reach fledge age, the fencing will be removed.
AMM 18	Should broods engage in foraging activity in the wrack line or other movement in the riding area, vehicle traffic flow will continue to be diverted or regulated to allow safe movement of the brood.
AMM 19	Monitors will continue to search for SNPL chicks in the riding area daily. During the chick-rearing period, each morning monitoring staff survey the open riding area surrounding the Southern Exclosure and other known SNPL nesting sites for chicks that have wandered out of protected fenced areas during the night. Monitors will continue to take appropriate action to protect and direct chicks into the non-vehicle area, as described in section 2.2.2.1.2.
AMM 20	CDPR will continue to place temporary 15-mph or other interpretive signs in areas where SNPL are known to congregate to alert drivers of their presence and to emphasize the shoreline speed limit. If possible, increased enforcement of speed limits will occur in areas where large numbers of SNPL are roosting.
AMM 21	Daily monitoring for the location of SNPL within the HCP area will continue to occur during the non-breeding season (October 1 through February 29), as staff levels and weather conditions allow. Monitoring will be increased if necessary (e.g., during storm events).
AMM 22	When, despite CDPR's efforts[89] to protect nests and/or move chicks back into the safety of the Southern Exclosure or other protected area, chicks and eggs are still at risk of being injured or killed by covered activities not related to covered species management (e.g., motorized recreation or new proposed activities), CDPR may capture up to 12 eggs (i.e., 4 nests) and/or 12 chicks (i.e., 4 broods) for captive rearing each year. In all cases, the need for captive care is determined by a USFWS-approved monitor and is used selectively. It is also dependent on an approved facility having the capacity to accept the eggs and/or chicks. If CDPR has captured 8 eggs or 8 chicks for captive rearing during one breeding season pursuant to this AMM, CDPR will contact the USFWS and discuss whether

[89] At times, based on Senior Environmental Scientist professional discretion, CDPR may determine that SNPL eggs and/or chicks should be collected and transferred to an approved wildlife facility without an attempt to protect them on-site because protecting eggs and/or directing chicks back to the exclosure will not eliminate the threat of covered activities.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
	modified or additional AMMs (e.g., expanding the exclosure along the shoreline to provide additional protected foraging habitat, increasing monitoring, and/or increasing signage) are appropriate to minimize risk of additional injury or mortality and ensure no more than 12 eggs and 12 chicks are captured for captive rearing[90]. Because this measure involves capture, which is considered take under FESA, it is included within CA-12b.
AMM 23	During the non-breeding season, if determined to be necessary to protect wintering SNPL, CDPR staff will temporarily close the beach within the HCP area, including the Arroyo Grande Creek crossing and the Grand Avenue park entrance, to motor vehicles during storm events with anticipated high tides and/or large surf until such conditions or hazards no longer exist. Beach conditions will be regularly monitored, and vehicle use will be allowed again only after CDPR staff has determined that it can occur without causing harm to SNPL, public safety is no longer an issue, and resource protection measures are no longer necessary.
AMM 24	CDPR peace officers will continue to provide focused enforcement of HCP area regulations (e.g., 15-mph speed limits). CDPR peace officers will continue to respond to requests by monitors for assistance with SNPL protection and security. Enforcement of laws affecting safety of SNPL will continue to be the highest non-emergency law enforcement priority.
AMM 25	During anticipated high visitor-use periods, such as Memorial Day Weekend, Labor Day Weekend, July 4 Weekend (or as determined by historic visitor attendance records), additional monitoring staff will continue to be employed and on site to monitor within the open riding area and identify threats to all life stages of SNPL from public recreational activity.
AMM 26	During non-holiday weekends (i.e., Friday and Saturday), a minimum of two CDPR peace officers will continue to be on duty and available from 0600 through 2400 each day to enforce regulations (e.g., 15-mph speed limit, dog leash laws, litter). During non-holiday weekdays (i.e., Sunday through Thursday), a minimum of two CDPR peace officers will continue to be on duty from 0700 through 2000 each day to enforce regulations.
AMM 27	As needed during holiday periods, staff will continue to focus specifically on monitoring the northern boundary of the closed protected shoreline (i.e., Southern Exclosure or 48-acre closed area when broods are present) to address any unauthorized entry during both daylight and evening hours.
AMM 28	During major holiday periods, CDPR peace officers will continue to be on duty 24 hours/day. From 0700 to 2000, a minimum of three Rangers will continue to be on duty. From 2000 to 0200, a minimum of two ranger/peace officers will continue to be on duty. During mid-day periods, when visitor attendance is highest, as many as four ranger/peace officers will continue to be on duty. Rangers/peace officers will enforce all regulations (e.g., 15-mph speed limit, dog leash laws, litter) in the HCP area.
AMM 29	CDPR will continue to use an adaptive management approach, where information and experience from previous breeding seasons is used to develop additional appropriate AMMs in subsequent seasons to minimize or eliminate impacts to SNPL from covered activities.
AMM 30	CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports.
AMM 31	Oceano Dunes SVRA will continue to participate in the Region 5 working group for SNPL recovery.
Potential Effects: Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with recreational activity.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 32	Trash dumpsters will continue to be provided near the OHV staging area near Post 2. The location of the trash dumpsters will be changed, as necessary, to avoid disturbance to any nearby active SNPL nests.
AMM 33	CDPR will continue to use trash dumpsters/receptacles that are covered at the top and open from the side, which are designed to attract fewer predators such as gulls. CDPR will continue to implement options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites including using covered dumpsters with openings on the side.
AMM 34	CDPR will continue to remove or modify signs, fence posts, and other man-made features to eliminate perches for predators in areas where they could impact SNPL.

[90] Capture associated with this AMM is a new covered activity proposed under the HCP, which is different from ongoing capture associated with natural resources management activities. This AMM is meant to address capture when eggs and chicks are threatened by non-covered species management activities, such as motorized recreation.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL
AMM 35 As appropriate and dictated by field conditions, CDPR will continue to have the option to install single-nest exclosures on SNPL nests in South Oso Flaco, the shoreline of the exclosures, or in other areas where they are deemed vulnerable to predators.
AMM 36 Seasonal exclosure and small single-nest exclosure fencing will continue to be buried, as feasible, to limit terrestrial predators from undermining the fence.
AMM 37 CDPR will continue to implement a predator management program to protect SNPL. In coordination with USFWS and if determined necessary, the predator management plan will be reviewed and updated to identify appropriate responses to new predator concerns.
AMM 38 When additional options for managing predators are needed, selective live-trapping and relocation of avian predators will continue to be conducted by authorized staff or subcontractor, and selective live-trapping and relocation or lethal removal of mammalian and avian predators will be conducted by USDA Wildlife Services (or other authorized staff or subcontractor).
AMM 39 CDPR staff will continue to remove animal carcasses in or adjacent to nesting and brood-rearing habitat, when feasible.
AMM 40 Where feasible, CDPR staff will continue to haze predators to flush them from sensitive areas. Hazing techniques used include firing a bird whistler device and approaching predators by foot or vehicle where appropriate. CDPR will continue to coordinate closely with predator specialists regarding the location of known or potential nests and brood activity, prior to the specialists conducting work.
AMM 41 All visitors will continue to be informed that they are to deposit their trash in dumpsters/receptacles provided. All campers will continue to be offered plastic garbage bags. All park staff will continue to carry trash bags in each vehicle and make them available to visitors for removing trash and litter from visitor use areas.
AMM 42 CDPR will continue to manually remove litter and garbage from beaches within existing budget and staff limitations.
Potential Effect: Breeding/foraging/roosting habitat quality reduced; Chicks, eggs, adults, juveniles potentially exposed to predation and/or inclement weather by altered habitat.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 43 CDPR will continue to place woodchips, large woody material, beach wrack, and native plants throughout the Southern Exclosure as necessary to serve as natural shelter. Woodchips will continue to be spread in patches in the 6, 7, and 8 Exclosures in areas of barren sand and over thinning woodchip patches remaining from the previous year(s) and beach wrack will be placed on the closed shoreline.
AMM 44 CDPR staff will continue to collect wrack in the open riding area and disperse it on the Southern Exclosure shoreline and on the 48-acre foredune shoreline if the area is used for nesting. In addition to providing cover, wrack on the shoreline provides a food resource supporting invertebrates, which in turn are prey for SNPL chicks, juveniles, and adults.
AMM 45 Talitrids (beach hoppers) will continue to be collected from outside the vehicle use area north of Grand Avenue or from South Oso Flaco. Staff will continue to inoculate the wrack addition areas of the Southern Exclosure shoreline with talitrids in order to establish a breeding population and increase SNPL food resources.
AMM 46 Habitat manipulation will occur in the Southern Exclosure to improve nesting habitat, including reducing vegetation density and removal of larger dune hummocks. The Superintendent may consider implementing additional habitat enhancement or manipulation measures if qualified biologist/Natural Resource staff determine such measures may aid in meeting the criteria laid out in biological objectives for SNPL (section 5.2.1). All work will be conducted during the non-breeding season. Qualified biologists/Natural Resource staff will conduct pre-activity surveys and at least one monitor will remain on-site when any heavy equipment is operating to ensure SNPL are avoided. If implemented, the value of any additional habitat enhancement or manipulation measure to nesting SNPL and CLTE will be studied to evaluate the measure's effectiveness at improving reproductive success and to determine whether and how the measure should be implemented in future seasons.
Park Visitor Activities: Camping (CA-2)
Potential Effects: Similar to motorized recreation activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Pedestrian Activities (CA-3)
Potential Effects: Breeding/foraging/roosting disturbance; Chicks and eggs picked up by visitors; Chicks/eggs abandoned when adults are disturbed, injured, or killed; Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 47 If an SNPL nest is established within 150 feet of a restroom facility, permanent restrooms buildings will continue to be closed to public use and wire fencing will continue to surround and isolate the restroom to prevent public use.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
	The restroom alleyways between the 48-acre foredune plots will continue to be closed when nests or broods are present in these plots. In addition, chemical toilets will continue to be relocated to a minimum distance of 330 feet from any SNPL nest site, or other distance based on best available site-specific information and in consultation with Wildlife Agencies.
AMM 48	CDPR will continue to use symbolic fencing, consisting of a single strand of rope strung between posts with signage, at South Oso Flaco to protect upper beach and dune habitat for nesting.
AMM 49	In instances where pedestrian activity is observed disturbing SNPL, CDPR will continue to ask visitors to relocate farther away from nests or broods, and symbolic fencing at South Oso Flaco will continue to be adjusted as needed.
AMM 50	Symbolic fencing will continue to be erected at the terminus end of the Oso Flaco boardwalk trail at the beach to direct visitors to the wet sand area of the beach and away from potential SNPL nesting and chick-rearing areas.
AMM 51	As needed during daylight hours on major holiday periods, one CDPR peace officer will continue to be assigned to patrol the beach. Duties include patrolling outside the Southern Exclosure areas to ensure that no entry is made into the exclosure.
Potential Effects: Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with pedestrian activities.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Visitor Activities: Bicycling and Golfing (CA-4)	
Potential Effects: Similar to pedestrian activities.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Visitor Activities: Fishing (CA-5)	
Potential Effects: Similar to pedestrian activities; Adults/juveniles/chicks potentially entangled in discarded fishing line/hooks; Chicks, eggs, adults, juveniles potentially exposed to predation by discarded bait.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 52	If fishing activity is observed disturbing SNPL, visitors will be asked to relocate farther away from nests and fencing will be adjusted, as necessary.
AMM 53	Anglers will continue to be encouraged to properly dispose of fishing lines, hooks, and bait at various locations within the park where trash receptacles are located. CDPR staff will continue to manually remove liter and garbage from beaches.
Park Visitor Activities: Dog Walking (CA-6)	
Potential Effects: Similar to pedestrian activities.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 54	Dogs within the HCP area will continue to be required to be on a leash no longer than 6 feet at all times and within the owner's complete control.
AMM 55	Dogs, other than service dogs, will continue to be banned in the Oso Flaco Area.
AMM 56	Waste bag locations will continue to be provided in the HCP area.
AMM 57	CDPR will continue to enforce dog leash and dog waste regulations, especially in areas where SNPL could be impacted. Resource staff monitors and/or rangers will continue to contact visitors violating park regulations and, where appropriate, rangers will continue to issue a citation.
Park Visitor Activities: Equestrian Recreation (CA-7)	
Potential Effects: Similar to pedestrian activities.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 58	Horses will continue to be banned in the Oso Flaco Area.
Park Visitor Activities: Boating/Surfing (CA-8)	
Potential Effects: Foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Visitor Activities: Aerial/Wind-Driven Activities (CA-9)	
Potential Effects: Foraging/breeding/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 59	Pursuant to Superintendent's Order (section 1.5.7), CDPR will continue to prohibit kite flying south of the Pier Avenue ramp during the SNPL breeding season (March 1 through September 30).
AMM 60	Open water kiteboarding/kite surfing, as well as launching and landing, will continue to be prohibited south of Post 6 and dry land launching and landing is only permitted between Pismo Creek and Pier Avenue.
AMM 61	All UAS operators will follow the current CDPR policies regarding UAS use. Pursuant to Superintendent's Order (section 1.5.7), CDPR will continue to prohibit public UAS use south of the Pier Avenue ramp during the SNPL and CLTE breeding season (March 1 through September 30). The Superintendent's Order will be adjusted to modify the

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
	timing and/or allowable locations for UAS use if staff observe SNPL routinely being flushed or otherwise harmed by public UAS use.
Park Visitor Activities: Holidays (CA-10)	
Potential Effects: Effects for all covered activities on holidays are not expected to be different from those on non-holidays.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 62	Fireworks will continue to be prohibited in the HCP area.
AMM 63	CDPR staff or CDPR Volunteers will continue to educate and contact the public during the July 4 holiday period, focusing on areas near the Southern Exclosure to help stop the use of illegal fireworks over the area.
Park Visitor Activities: Special Events (CA-11)	
Potential Effects: Effects based on the specific event activity(ies) permitted (see section 2.2.1.11).	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 64	All permits authorizing special events will continue to include AMMs to reduce disturbance to SNPL. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
AMM 65	CDPR will continue to monitor special events to ensure participants follow SNPL protective measures.
AMM 66	All UAS operators will follow the current CDPR policies regarding UAS use.
AMM 67	Specific AMMs for UAS use will be included in special event permits that the UAS operators must obtain from CDPR. For example, non-CDPR UAS will not be allowed near nesting areas south of Post 4.5 during the breeding season and will be limited along the shoreline whenever necessary to avoid impacting SNPL. In addition, a trained SNPL monitor will accompany non-CDPR UAS operators at any time of year if it is determined there is potential to impact covered species. Stable flight paths are preferred to minimize the UAS being perceived as a predator.
Natural Resources Management: SNPL Fencing, Monitoring, and Management (CA-12a and 12b)	
Potential Effects: Chicks crushed by vehicle; Breeding/foraging/roosting disturbance; Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Chicks/eggs abandoned when adults are disturbed, injured, or killed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 68	Seasonal exclosure and symbolic fencing will continue to be installed and completed by the March 1 start of the SNPL breeding season.
AMM 69	Monitors that enter and walk within the Exclosures and other areas with nests/broods will continue to be those individuals approved by the USFWS and/or listed on appropriate permits for the covered activities.
AMM 70	Single-nest or smaller exclosures for nests in the non-motorized area will continue to be erected when at least two eggs have been laid, or after nest is consistently incubated, to help reduce abandonment threat.
AMM 71	Fence maintenance and bumpout installation will continue to be timed to avoid high wind periods and other periods deemed critical for chick or nest survival, like extreme temperatures.
AMM 72	Monitors will continue to escort maintenance vehicles driving through the shoreline closed for nesting. All CDPR staff driving within the closed shoreline area will continue to be trained on how to operate a vehicle on the shoreline when SNPL broods are present to avoid collision or other harm, e.g., scanning in front of vehicle, driving where chicks are less likely to occur, avoiding wrack, and keeping speeds at or below 5 mph.
AMM 73	Monitors will continue to conduct surveys prior to conducting SNPL fence maintenance activities. If nesting SNPL could be impacted by activities, monitors will postpone maintenance, if appropriate. Monitors will remain on site during fence maintenance/ installation conducted by hand to monitor nearby nests and minimize disruption to SNPL.
AMM 74	If any chicks are flushed out of an exclosure, monitors will continue to follow and protect chicks until they move back inside the exclosure as described in section 2.2.2.1.2.
AMM 75	Camera training will continue to be given by staff who are permitted by USFWS to use nest monitoring cameras. Training will continue to occur outside the nesting area to include reading the instruction manual of each camera system, practicing efficient camera installation, and proper placement and concealment of cameras. After the initial training, the trainee will continue to accompany the permitted staff during camera installation on two or more active nests, as well as lead the camera installation while under the guidance of the permitted staff. Cameras will continue to only be placed if the wind speed is below 15 mph, the sand temperature is below 83°F, and if it is not raining.
AMM 76	Camera set-up will continue to be delayed if there has been a recent sighting of a predator.
AMM 77	Monitors will continue to evaluate whether a nest is a good candidate for predator monitoring prior to installing a camera. Cameras will not be placed in areas where they are readily visible to the public.
AMM 78	Cameras will continue to be installed when the nest has a complete clutch, and monitors will stay on site to ensure the adult returns to the nest, when possible. In some instances, as determined by experienced CDPR biologists, a

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
	camera needs to be installed prior to the nest having a complete clutch. For example, cameras may be temporarily used to determine nest abandonment.
AMM 79	Cameras will continue to be placed approximately 6 feet away from the selected nest, depending on topography and other factors.
AMM 80	Nests with cameras will be monitored closely using binoculars or a spotting scope, when visible, to determine if adults are attending nests and not disturbed by the camera. Monitors will continue to remove the cameras immediately if there is evidence that the placement and/or operation of the camera is jeopardizing the safety of individual nests, eggs, and young.
AMM 81	SNPL nest camera use will continue to follow protocols approved by USFWS.
Potential Effects: Chick and adult mortality/injury during banding; Chicks/eggs crushed by vehicle or monitor; Chicks flushed into the open riding area; Chicks injured or killed due to adult aggression from brood movement caused by monitoring activities; Adults killed or injured by striking protective fencing; Adults, juveniles, chicks, eggs depredated at single-nest exclosures.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 82	CDPR will continue to use appointed staff that have obtained the appropriate state and federal permits for the SNPL breeding season. The permitted staff will continue to be responsible for the banding of SNPL chicks, and if determined necessary, banding of SNPL adults. The permitted staff will continue to work in consultation with and under the direction of experienced Natural Resource staff.
AMM 83	Banding of newly hatched SNPL chicks will continue to follow protocols approved by USFWS. The permitted staff will continue to report all banding data and records per guidelines established by the USFWS.
AMM 84	To minimize the risk of additional injury or mortality associated with leg bands, monitors will continue to capture birds that show signs of leg injury due to bands as soon as possible. Leg injury will be assessed and, if necessary, the bird will be taken to a veterinarian for medical treatment or bands will be removed.
AMM 85	Monitors will continue to only enter and walk within the Exclosures and other areas with nests/broods during appropriate weather conditions (e.g., low to no wind, no rain, outside of periods of extreme temperatures). Monitors will also continue to survey for potential predators prior to entering the nesting areas and will not enter the exclosure until predators are absent from the area.
AMM 86	Monitors will continue to be aware of the location of nests, broods, and adults when monitoring within the Exclosures and other areas with nests/broods, and all efforts will continue to be made to minimize disturbance to reduce the likelihood of adults moving off the nest, broods moving into the territory of another nest, and/or chicks being separated from attending adults.
AMM 87	Monitors will continue to visually check the area under and surrounding any vehicle that has been idle near all nesting areas during the chick-rearing period to ensure SNPL chicks are not present underneath the vehicle.
AMM 88	The top of the Southern Exclosure fencing will continue to be lined with a strip of thick plastic fencing (orange silt construction fencing cut into approximately 1-foot sections), which will be placed along most of the western and northern fenced areas to increase the fence visibility to flying birds. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip.
AMM 89	Monitors will continue to inspect the integrity of exclosures regularly.
AMM 90	Single-nest exclosures will continue to be monitored closely to identify if predators are keying in on them.
AMM 91	Monitors will continue to closely survey the east fence of the Southern Exclosure, and other nesting areas that may border the open riding area, when banding or other monitoring activities are taking place on foot inside the fenced area during the chick-rearing period. They will continue to take appropriate action to coax any SNPL chicks that move into the riding area back into the protected non-vehicle area and will ascertain if they remain there after the monitoring activities in the exclosure have ended.
AMM 92	CDPR will continue to salvage eggs and chicks as part of the ongoing covered species management program, as determined to be necessary by a USFWS-approved biologist, to be raised in captivity by an approved wildlife facility. Chicks will continue to be raised in a manner that does not imprint on humans and released back into the wild when fledged. Captive care will continue to only be used selectively and not as a substitute for responding to the primary causes of elevated egg or chick abandonment rates.
Natural Resources Management: Tidewater Goby and Salmonid Surveys (CA-13)	
Potential Effects: Chicks/eggs crushed by vehicle or monitor; Breeding/foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 93	Daily SNPL monitoring during the SNPL breeding season will continue to include areas where fisheries surveys would occur. Fisheries surveys will continue to be adjusted if daily SNPL monitoring determines that SNPL breeding would be affected, including postponing surveys if there is concern of disturbance to SNPL nests or broods.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL
AMM 94 Fisheries survey staff will continue to include personnel experienced with conducting fisheries surveys within SNPL habitat and may include permitted SNPL monitors.
Natural Resources Management: Herpetological Monitoring and Management (CA-14)
Potential Effects: Chicks/eggs crushed by vehicle or monitor; Breeding/foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Natural Resources Management: Listed Plant Management Activities (CA-15)
Potential Effects: Chicks/eggs crushed by vehicle or monitor; Breeding/foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 95 If surveys are necessary during the breeding season and in a known or potential nesting area, one or two experienced biologists will continue to conduct listed plant surveys. Established protocols for the surveys require that any biologist conducting the work be a skilled botanist with experience in identifying the target plant species or be accompanied by a botanist. The biologist must also be a skilled and USFWS-approved SNPL monitor or must be accompanied by a biologist with these qualifications. AMM 96 Prior to conducting botanical surveys, the team will continue to review records of all known SNPL nesting sites in the survey area. No surveys are conducted within 150 feet of known nesting sites until the nest fates are determined (i.e., hatch or fail), and the brood and attending adult are known to have left the area. No surveys or walking within sight of nests occurs for nests that are close to hatch or newly hatched. AMM 97 Botanical surveys may be conducted in areas without known nests; however, the team will continue to follow existing nest search protocols to identify new nests, breeding behavior, and the presence of adults tending broods. AMM 98 If new nests, breeding behavior, or adults tending broods are observed in an area during surveys, the team will continue to immediately leave the area until the nest fates are determined or breeding/brooding activity is no longer occurring in the area. AMM 99 Botanical surveys will continue to take the minimum time necessary for data collection to avoid disturbance to breeding birds in the area. Botanical surveys will continue to take no longer than 15 minutes at each site within the breeding area. AMM 100 All botanical surveys will continue to be conducted under similar constraints as nest search surveys including during appropriate weather conditions, wind conditions, times when predator activity is not occurring, and other precautions per SNPL monitoring protocol in the HCP area.
Natural Resources Management: Habitat Restoration Program (CA-16)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Natural Resources Management: Invasive Plant and Animal Control (CA-17)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 101 Invasive plant or animal control will continue to be conducted when SNPL are not observed to be present.
Natural Resources Management: WHPP Implementation (CA-18)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Natural Resources Management: Water Quality Monitoring Projects (CA-19)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: General Facilities Maintenance (CA-21)
Potential Effects: Breeding/foraging/roosting disturbance; Chicks/eggs abandoned when adults are disturbed, injured, or killed; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Adults/juveniles/chicks struck by vehicles; Eggs crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 102 CDPR will continue to train park staff and "visiting rangers" annually, or as needed, to ensure that staff can do their jobs with minimal impact to SNPL. At a minimum, staff will continue to receive information about basic SNPL biology, listing status, and relevant park rules and regulations and how to respond to observed violations of park rules and regulations that protect SNPL. AMM 103 All CDPR staff will continue to observe closures, speed limits, and other restrictions aimed at protecting SNPL, unless emergency conditions warrant otherwise. AMM 104 CDPR monitors will continue to conduct surveys to ascertain the presence of SNPL nests, adults, and chicks within and adjacent to potential maintenance areas, if such activities must be carried out during the breeding season

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
	(March 1 through September 30) in and adjacent to areas where SNPL are potentially nesting, foraging, or roosting. If CDPR monitors find that the activities may impact, disturb, or result in take of adult birds, chicks, or eggs, the activities will be delayed until the monitor determines SNPL will not be impacted.
AMM 105	CDPR monitors will continue to evaluate the potential for maintenance activities that occur during the non-breeding season (October 1 through February 29) to impact or disturb non-breeding SNPL or to modify SNPL breeding habitat. Activities will continue to be modified, as necessary, to minimize disturbance or impacts to breeding habitat.
AMM 106	Mechanical trash removal will not occur in areas when any SNPL are present in the treatment area.
AMM 107	Mechanical trash removal will only occur above the high tide, avoid all wrack/surf cast kelp, avoid all live vegetation, and avoid lagoons and flowing creeks.
AMM 108	Equipment for trash removal will observe all speed limits and will not exceed 10 mph.
AMM 109	Mechanical trash removal will not be conducted within vegetated areas or within any fenced closed areas where known SNPL nesting occurs (such as the Southern Exclosure or 48-acre foredune area) during the breeding or non-breeding season.
AMM 110	Qualified biologists/Natural Resource staff will inspect and approve the area subject to mechanical trash removal prior to each deployment. Qualified biologist/Natural Resource staff will remain on site or be immediately available for monitoring purposes.
AMM 111	In conjunction with mechanical trash removal, CDPR will implement a study to establish baseline conditions of invertebrate populations, including talitrids, and to determine the impact of mechanical trash removal on these populations. The study will, at a minimum, compare invertebrate abundance in mechanical trash removal areas to baseline conditions prior to the start of mechanical trash removal to areas where mechanical trash removal is absent. If CDPR finds a substantial decline in invertebrate numbers in mechanical trash removal areas, additional measures will be implemented (e.g., habitat enhancement measures, reduction in frequency of mechanical trash removal, and/or reduction in mechanical trash removal locations).
Potential Effects: Limited potential breeding habitat reduced by the footprint of vault toilets.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Trash Control (CA-22)	
Potential Effects: Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Wind Fencing Installation, Maintenance, and Removal (CA-23)	
Potential Effects: Foraging and roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Sand Ramp and other Vehicular Access Maintenance (CA-24)	
Potential Effects: Foraging and roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 112	During the breeding season, the sand ramps will continue to be inspected a minimum of once per day to identify SNPL individuals and nests. This will continue to occur during the daily survey. During the non-breeding season, the sand ramps will continue to be regularly inspected for roosting activity. No work occurs if birds are roosting close to the work area until the birds leave the area on their own accord.
Park Maintenance: Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)	
Potential Effects: Foraging and roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate	
AMM 113	Conduct pre-construction SNPL monitoring.
Park Maintenance: Cable Fence Maintenance and Replacement (CA-28)	
Potential Effects: Foraging and roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate	
AMM 114	Conduct pre-construction SNPL monitoring.
Park Maintenance: Heavy Equipment Response in all Areas of SVRA of Oceano Dunes District (CA-29)	
Potential Effects: Similar to general facilities maintenance activities.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL
Park Maintenance: Minor Grading (less than 50 cubic yards) (CA-30)[91]
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Boardwalk and Other Pedestrian Access Maintenance (CA-31)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Ranger, Lifeguard, and Park Aide Patrols (CA-32)
Potential Effects: Similar to general facilities maintenance activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Emergency Response (CA-33)
Potential Effects: Similar to general facilities maintenance activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 115 Emergency responders will continue to be informed of the locations of areas that are sensitive (e.g., Southern Exclosures, shoreline foraging/brooding areas), to the extent feasible. If possible, USFWS-approved biologists will continue to escort emergency vehicles into and out of areas that are sensitive. AMM 116 Locations of non-breeding flocks of SNPL will continue to be identified and appropriate signage displayed to advise all visitors and emergency responders of the location of sensitive resource areas.
Visitor Services: Access by Non-CDPR Vehicles (CA-34)
Potential Effects: Adults/juveniles/chicks struck by vehicles; Foraging/roosting disturbance; Chicks/eggs abandoned when adults are disturbed, killed, or injured; Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Beach Concessions (CA-36)
Potential Effects: Similar to access by non-CDPR vehicles.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 117 A focused training program will continue to be provided for all concessionaires and OHV rental employees each year. The training program will consist of, at a minimum, a description of SNPL and its life history and park rules and regulations protecting SNPL. Concessionaires and OHV rental employees will continue to be provided with digital resources consisting of photographs and covered species information. This information will continue to be provided to customers and other members of the public to encourage them to recognize and avoid covered species.
Other HCP Covered Activities: Motorized Vehicle Crossing of Creeks (CA-40)
Potential Effects: Adults/juveniles/chicks struck by vehicles; Nesting/foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Pismo Creek Estuary Seasonal (floating) Bridge (CA-41)
Potential Effects: Breeding/foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply as appropriate. AMM 118 Bridge installation, removal, and use during the breeding season will need to follow AMMs, including pre-installation surveys and 100-foot minimum buffers from active nests, to ensure effects on nesting and chick rearing SNPL are minimal. The buffer will be increased (e.g., by adding a bumpout), as necessary, until monitors observe that nesting and chick rearing SNPL are no longer disturbed. During the non-breeding season, bridge installation and removal will occur after surveys have been done to ensure effects on foraging and roosting SNPL are minimal.
Other HCP Covered Activities: Replacement of the Safety and Education Center (CA-43)
Potential Effects: Chicks/eggs crushed by vehicle; Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Dust Control Activities (CA-44)

[91] AMMs to reduce the effects of grading to maintain the seasonal exclosure are included in CA-12a: Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fence. AMMs to reduce the effects of grading to maintain the boundary fence are included in CA-28: Cable Fence Maintenance and Replacement.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL
Potential Effects: Adults/juveniles/chicks struck by vehicles; Breeding/foraging/roosting disturbance; Eggs crushed; Chicks/eggs abandoned when adults are disturbed, killed, or injured; Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Adults, juveniles, chicks, eggs more susceptible to predation due to increased vegetation; Breeding/foraging/ roosting habitat altered.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 119 Exclosures will be managed to ensure the enclosed area retains the necessary physical and biological characteristics of primary habitat as defined in section 3.3.1.8 and as indicated by breeding productivity, including the breeding number and fledge rate targets in SNPL Objectives 1.1 and 1.2, respectively.
Other HCP Covered Activities: Cultural Resources Management (CA-45)
Potential Effects: Breeding/foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Special Projects (CA-49)
Potential Effects: Breeding/foraging/roosting disturbance Breeding habitat reduced by footprint of small project.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Reduction of the Boneyard and 6 Exclosure (CA-50)
Potential Effects: Reduction in protected nesting habitat.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Use of Pesticides (CA-51)
Potential Effects: Breeding/foraging/roosting disturbance; Exposure from contact with contaminated prey or vegetation; Exposure from contact with residues, inhalation of vapors.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 120 When pesticide application must occur near SNPL breeding habitat, work will continue to be conducted between October 1 and February 28 to avoid the breeding season. A qualified biologist/Natural Resource staff will continue to conduct a survey for SNPL 24 hours prior to the application and instruct the work crew on their identification and biology. If SNPL is observed, all work will be stopped immediately until the CDPR biologist arrives and assesses the situation to determine if the work can proceed. AMM 121 Pesticides will continue to be applied when wind speed is below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. AMM 122 Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or the National Weather Service (NWS) forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application. AMM 123 CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats. AMM 124 CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that pesticide application activities do not result in impacts to covered species. AMM 125 If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned up according to label instructions, and all equipment used to remove spills will continue to be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements. AMM 126 CDPR will continue to take the following steps when using herbicide: ● Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. ● CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made. ● All pesticide applications will continue to be made according to the product label in accordance with regulations of the EPA, California Environmental Protection Agency (CalEPA), California Division of Occupational Safety and Health (Cal OSHA), DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL

Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

Other HCP Covered Activities: CDPR UAS Use for Park Activities (CA-52)[92]

Potential Effects: Breeding/foraging/roosting disturbance.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Year-Round - All Flights

AMM 127 UAS will be flown with remote control and a screen that shows battery life. The UAS will be equipped with software or other safeguard to ensure it will alert the operator when it reaches a minimum safe amount of battery life required for a return flight.

AMM 128 UAS operators will attend a formal site-specific training and achieve a Remote Pilot Certificate under Federal Aviation Administration (FAA) Small UAS Rule (Part 107) and be certified as a Pilot in Command prior to conducting solo flights.

AMM 129 CDPR staff operating UAS will be trained in the safe operation of UAS in the vicinity of nesting or roosting SNPL. Training will include safe practices for takeoff, landing, flights over birds (set flight path, no erratic path that could be mistaken for a predator), minimum height over birds, no turns over nests, preferred operation over waves, and other methods to reduce impacts to nesting or roosting birds.

Year-Round - Routine Flights

AMM 130 UAS operators will have an established flight plan with a specific purpose determined following all FAA regulations.

AMM 131 UAS will be kept in view of the operator or Visual Observer(s) at all times.

AMM 132 Other than public safety or emergency law enforcement use, UAS operators will not conduct flights in the HCP area without approval from the qualified biologist/Natural Resource staff.

AMM 133 The flight plan will not include erratic flight patterns that could be interpreted as an avian predator by SNPL.

Breeding Season - Routine Flights

AMM 134 All flights within 328 feet of SNPL nesting or brood-rearing habitat will require a USFWS-approved monitor to pilot or assist with flight logistics and monitoring, regardless if SNPL are confirmed in the area prior to flight.

AMM 135 Prior to flying the UAS into or near (within 328 feet of) nesting or chick-rearing areas, the operator will follow all existing monitoring guidelines that have been established with USFWS.

AMM 136 UAS will not enter or fly within 328 feet of the SNPL nesting areas if the wind speed is above 15 mph or strong enough to move sand (or will be before or after completion of set up and exit from the nesting area), the sand temperature is 83°F, or if it is raining.

AMM 137 UAS flights will be initiated at least 328 feet from the closest known SNPL nest. The take-off and landing area will be clearly marked. If possible, take-off and landing areas will be out of direct sight from known nests.

AMM 138 UAS will only be deployed when a qualified biologist/Natural Resource staff is confident the activity will not jeopardize the safety of SNPL individuals, nests, eggs, and young.

AMM 139 Prior to every UAS flight, a qualified biologist/Natural Resource staff will scan the area for SNPL. If no birds are observed, the UAS flight can commence. The flight operations will be monitored, as appropriate. If a SNPL is observed in the area, it must be monitored by a qualified biologist/Natural Resource staff during the remainder of the flight. If substantial disturbance to SNPL is observed, they may recommend increasing the altitude of the UAS (but still remaining below 400 feet to follow FAA guidelines) and/or guiding the UAS to a safer area.

AMM 140 The UAS will be kept at least 100 feet above the ground at all times to reduce disturbance to nesting birds and below 400 feet to follow FAA guidelines.

Non-breeding Season – Routine Flights

AMM 141 UAS will only be deployed when a qualified biologist/Natural Resource staff is confident that the activity will not jeopardize the safety of SNPL individuals.

AMM 142 Prior to every UAS flight within 1,000 feet of the shoreline, a qualified biologist/Natural Resource staff will scan the area for SNPL. If no birds are observed, the UAS flight can commence with or without monitoring, as appropriate. If an SNPL is observed in the area, it must be monitored by a qualified biologist/Natural Resource staff during the

[92] AMMs for UAS use may be modified based on best available science and new information on the impacts of UAS use on wildlife.

Table 5-2. Avoidance and Minimization Measures (AMMs) for SNPL	
	remainder of the flight. If substantial disturbance to SNPL is observed, they may recommend increasing the altitude of the UAS (but still remain below 400 feet to follow FAA guidelines) and/or guiding the UAS to a safer area.
AMM 143	Take-off and landing areas will be clearly marked in the field and should be out of sight from known individuals.
AMM 144	If SNPL are present, the UAS will fly at least 100 feet above ground at all times to reduce disturbance to SNPL and will be kept below 400 feet to follow FAA guidelines.
Year-Round – Law Enforcement/Public Safety Flights	
AMM 145	Law enforcement UAS training will include advanced training to minimize impacts during emergency response.
AMM 146	In the event of a law enforcement or public safety issue that requires a UAS to be flown in the vicinity of roosting or nesting SNPL, the operator will limit time that UAS are flown in the vicinity of nesting or roosting birds to the maximum extent practical.
AMM 147	If an emergency situation requires the UAS to cross over nesting areas, the UAS will be flown as close to the 400-foot FAA ceiling as possible, and transit the area quickly in a direct path, to avoid disturbance and limit its duration. A visual observer will always be present to aid in watching for other aircraft and birds.

5.3.1.2 California Least Tern

The majority of AMMs for CLTE are part of the ongoing SNPL and CLTE management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, CDPR UAS use) and the AMMs for these activities are new as well. The table below lists the AMMs that will reduce potential effects from covered activities for CLTE (section 4.4.1). Covered activities that do not have effects on CLTE are not listed in the table.

Table 5-3. Avoidance and Minimization Measures for CLTE	
Park Visitor Activities: Motorized Recreation **(CA-1)**	
Potential Effects: Adults/juveniles/chicks struck by vehicles; Breeding/roosting disturbance; Chicks separated from adult(s); Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Chicks/eggs abandoned when adults are disturbed, killed, or injured; Eggs crushed.	
AMM 1	CDPR will continue to create educational content on the Oceano Dunes SVRA and Pismo State Beach websites that includes life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well.
AMM 2	Signs explaining CLTE natural history and protection measures in place in the HCP area will continue to be posted for information and education of visitors in the HCP area. Interpretive panels at beach access points (e.g., Sand Highway, Oso Flaco Lake, Pier Avenue, and Grand Avenue) and signs identifying closed areas will continue to be erected to increase public awareness of threats to nesting CLTE and to inform the public of the park's management efforts to protect special-status species. Information on CLTE will also continue to be posted on the Oceano Dunes SVRA and Pismo State Beach websites.
AMM 3	CDPR will continue to enforce resource protection regulations. All enclosed areas will continue to be posted with signs in English and Spanish. Rangers will continue to have the responsibility to enforce park regulations enacted to protect CLTE, including issuing citations for incidents of trespass into the area closed for nesting. In addition, resource staff monitors will continue to contact visitors violating park regulations and, where appropriate, contact rangers who will continue to issue a citation.
AMM 4	Posted speed limits will continue to be enforced throughout the HCP area.
AMM 5	CDPR will continue to fence off the Southern Exclosure and North Oso Flaco Exclosure during the breeding season (March 1 through September 30) to limit vehicle and human disturbance to CLTE nesting areas (and to protect CLTE from terrestrial predators). The 48-acre foredune area is closed to the public when CLTE nests or broods are present.
AMM 6	A buffer zone a minimum of 100 feet that prohibits camping or parking vehicles will be established outside and around areas closed for nesting (e.g., Southern Exclosure, single-nest exclosures, bumpouts) and for nests found in the 48-acre foredune or vegetation islands.
AMM 7	Habitat enhancement will continue to be avoided within 100 feet of the fence that borders the open riding area to discourage nesting near recreation that may cause disturbance to breeding birds.

Table 5-3. Avoidance and Minimization Measures for CLTE	
AMM 8	Daily monitoring will continue to take place during the CLTE breeding season to enable better identification of potential human use-related threats to CLTE and to summon law enforcement assistance, if needed, to prevent or eliminate any human use-related threats to the species.
AMM 9	If a CLTE is found injured or dead, CDFW and USFWS will be notified within 24 hours of finding the bird, with details of the event sent in email within 3 working days.
AMM 10	The open riding area will continue to be inspected a minimum of once per day during the breeding season to identify CLTE individuals and nests. All CLTE tracks in the riding area will continue to be followed to check for potential nests and any CLTE breeding activity in the riding area (e.g., scrapes, pairs observed, or nesting flight behavior) will continue to be monitored closely. These areas will continue to be mapped, and one person will be assigned each morning to recheck any potential breeding areas. Any nest found will continue to be immediately protected with a large single-nest (i.e., minimum 330-foot radius, or other distance based on best available site-specific information and in consultation with Wildlife Agencies) exclosure to protect nests from people and predators. If feasible and necessary, a travel corridor will be erected to provide a safe passage for chicks to the existing Southern Exclosure.
AMM 11	If a CLTE nest is established within the open riding area, but adjacent to the existing Southern Exclosure boundary (e.g., within or close to the minimum 330-foot buffer distance), fencing will continue to be erected to enlarge the exclosure to encompass the nest site (if topography allows and if safe public traffic patterns are available). Fencing will continue to be placed at a minimum of 330 feet away from the nest site, or other distance based on best available site-specific information and in consultation with Wildlife Agencies.
AMM 12	When two or more CLTE nests in the open riding area are located within 500 feet of each other and are 500 feet or more away from the seasonal exclosure, they will continue to be encompassed into a new large temporary exclosure if topography allows. Fencing for such new temporary exclosures will continue to be maintained a minimum distance of 330 feet from the nest site, or other distance based on best available site-specific information and in consultation with Wildlife Agencies.
AMM 13	If a CLTE nest is initiated inside the Southern Exclosure and close to the exclosure fence bordering the riding area, CDPR staff will continue to install additional fencing (i.e., "bumpout") to maintain a perimeter of a minimum of 330 feet from the open riding and camping area to the nest, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. The public is excluded from these bumpouts, but USFWS-approved monitors still enter the buffer area as needed for monitoring. These bumpouts will continue to be monitored regularly. If an incubating bird is disturbed by normal recreational activity, the bumpout will be increased in size, as needed. All nests are monitored for disturbance, and any nest that is disturbed by regular recreation activity may receive a bumpout. This additional fencing will continue to remain in place during the period when nests are active or chicks are found in this area. Once chicks move out of the area or reach fledge age, the bumpouts will be removed.
AMM 14	At least one CDPR vehicle or trailer will continue to be available throughout the CLTE breeding season to carry all tools and equipment necessary to immediately construct a single-nest exclosure or bumpout.
AMM 15	A 330-foot minimum buffer, or other distance based on best available site-specific information and in consultation with Wildlife Agencies, from recreation activities will continue to be established around all CLTE nests. This distance will be increased if any take (e.g., mortality, injury) or CLTE reacting negatively to normal recreational activities is observed.
AMM 16	CLTE nests in single-nest exclosures or temporary exclosures will continue to have silt fencing or small mesh chick fencing installed within or attached to the lower portion of the exclosure fence prior to hatch to prevent CLTE chicks traveling into the open riding area.
AMM 17	CDPR monitors will continue to monitor the location of the CLTE night roost each night as viewing conditions allow and search during daily morning surveys for tracks and other signs of the night roost (e.g., roosting scrapes, fecal matter). CDPR has a protocol in place to protect the night roost if it is found in an area where birds would be vulnerable to recreation activity, including closing off the area with fencing and implementing a minimum 330-foot buffer around the night roost location, or other distance based on best available site-specific information and in consultation with Wildlife Agencies. Fencing will continue to be added as deemed necessary by experienced Natural Resource staff and fencing will continue to be removed once the night roost is no longer present. This protocol will continue to be implemented if this situation occurs.
AMM 18	CDPR peace officers will continue to provide focused enforcement of HCP area regulations (e.g., posted speed limits). CDPR peace officers will continue to respond to requests by monitors for assistance with CLTE protection and security. Enforcement of laws affecting safety of CLTE will continue to be the highest non-emergency law enforcement priority.

Table 5-3. Avoidance and Minimization Measures for CLTE	
AMM 19	During anticipated high visitor-use periods, such as Memorial Day Weekend, Labor Day Weekend, July 4 Weekend (or as determined by historic visitor attendance records), additional monitoring staff will continue to be employed and on site to monitor within the open riding area and identify threats to all life stages of CLTE from public recreational activity.
AMM 20	During non-holiday weekends (i.e., Friday and Saturday), a minimum of two CDPR peace officers will continue to be on duty and available from 0600 through 2400 each day to enforce regulations (e.g., 15-mph speed limit, dog leash laws, litter). During non-holiday weekdays (i.e., Sunday through Thursday), a minimum of two CDPR peace officers will continue to be on duty from 0700 through 2000 each day to enforce regulations.
AMM 21	As needed during holiday periods, field staff will focus specifically on monitoring the northern boundary of the closed protected shoreline (i.e., Southern Exclosure or 48-acre closed area) to address any unauthorized entry during both daylight and evening hours.
AMM 22	During major holiday periods, CDPR peace officers will continue to be on duty and available to assist with protection of CLTE from 0630 to 2400, a minimum of 2 peace officers will be on duty. During mid-day periods, when visitor attendance is highest, as many as four ranger/peace officers will continue to be on duty. Rangers/peace officers will continue to enforce all regulations (e.g., trespass into exclosures,15-mph speed limit, dog leash laws, litter) in the HCP area.
AMM 23	CDPR will continue to use an adaptive management approach, where information and experience from previous breeding seasons is used to develop appropriate AMMs in subsequent seasons to minimize or eliminate impacts to CLTE from covered activities.
AMM 24	CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports.
Potential Effects: Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with recreational activity.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 25	Trash dumpsters will continue to be provided near the OHV staging area near Post 2. The location of the trash dumpsters will be changed, as necessary, to avoid disturbance to any nearby active CLTE nests.
AMM 26	CDPR will continue to use trash dumpsters/receptacles that are covered at the top and open from the side, which are designed to attract fewer predators such as gulls. CDPR will continue to implement options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites including using covered dumpsters with openings on the side.
AMM 27	CDPR will continue to remove or modify signs, fence posts, and other human-made features to eliminate perches for predators in areas where they could impact CLTE.
AMM 28	CDPR will continue to implement a predator management program to protect CLTE. In coordination with USFWS and if determined necessary, the predator management plan will be reviewed and updated to identify appropriate responses to new predator concerns.
AMM 29	When additional options for managing predators are needed, selective live-trapping and relocation of avian predators will continue to be conducted by authorized staff or subcontractors, and selective live-trapping and relocation or lethal removal of mammalian and avian predators will continue to be conducted by USDA Wildlife Services (or other authorized subcontractor).
AMM 30	CDPR staff will continue to remove animal carcasses in or adjacent to nesting and chick-rearing habitat.
AMM 31	Where feasible, CDPR staff will continue to haze predators to flush them from sensitive areas. Hazing techniques used include firing a bird whistler device and approaching predators by foot or vehicle where appropriate. CDPR will continue to coordinate closely with predator specialists regarding the location of known or potential nests and chick activity, prior to the specialists conducting work.
AMM 32	All visitors will continue to be informed that they must deposit their trash in dumpsters/receptacles provided. All campers will be offered plastic garbage bags. All park staff will continue to carry trash bags in each vehicle and make them available to visitors for removing trash and litter from visitor use areas.
AMM 33	CDPR will continue to manually remove litter and garbage from beaches.
AMM 34	The seasonal exclosure fence will continue to be buried to limit terrestrial predators from undermining the fence.
Potential Effects: Breeding/foraging/roosting habitat quality reduced; Chicks, eggs, adults, juveniles potentially exposed to predation and/or inclement weather by altered habitat.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 35	CDPR will continue to place woodchips, large woody material, beach wrack, and native plants throughout the Southern Exclosure, where appropriate, to serve as natural shelter. Woodchips will be spread in patches in the 6, 7,

Table 5-3. Avoidance and Minimization Measures for CLTE
and 8 Exclosures in areas of barren sand and over thinning woodchip patches remaining from the previous year(s) and beach wrack will be placed on the shoreline closed for nesting.
AMM 36 Driftwood will continue to be placed throughout the Southern Exclosure to serve as natural shelter for CLTE chicks.
AMM 37 Habitat manipulation will occur in the Southern Exclosure to improve nesting habitat, including reducing vegetation density and removal of larger dune hummocks. The Superintendent may consider implementing additional habitat enhancement or manipulation measures if qualified biologist/Natural Resource staff determine such measures may aid in meeting the criteria laid out in biological objectives for CLTE (section 5.2.2). All work will be conducted during the non-breeding season. If implemented, the value of any additional habitat enhancement or manipulation measure to nesting SNPL and CLTE will be studied to evaluate the measure's effectiveness at improving reproductive success and to determine whether and how the measure should be implemented in future seasons.
Park Visitor Activities: Camping (CA-2)
Potential Effects: Similar to motorized recreation activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Pedestrian Activities (CA-3)
Potential Effects: Breeding/foraging/roosting disturbance; Chicks and eggs picked up by visitors; Chicks/eggs abandoned when adults are disturbed, injured, or killed; Chicks separated from adult(s) and inadequately fed; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 38 If a CLTE nest is established within 330 feet of a restroom facility, permanent restrooms buildings will continue to be closed to public use and wire fencing will continue to surround and isolate the restroom to prevent public use. In addition, chemical toilets will continue to be relocated to a minimum distance of 330 feet from any CLTE nest site, or other distance based on best available site-specific information and in consultation with Wildlife Agencies.
AMM 39 If, in the opinion of the qualified biologist/Natural Resource staff or monitors, visitor activities are significantly disrupting CLTE behavior, the footbridge hand railing at Oso Flaco Lake will continue to be closed to public use, or types or public use on the boardwalk will continue to be temporarily prohibited until CLTE have left the lake area.
AMM 40 As needed during daylight hours on major holiday periods, one CDPR peace officer will continue to be assigned to patrol the beach. Duties include patrolling outside the Southern Exclosure areas to ensure that no entry is made into the exclosure.
Potential Effects: Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with recreational activity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Bicycling and Golfing (CA-4)
Potential Effects: Similar to pedestrian activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Fishing (CA-5)
Potential Effects: Similar to pedestrian activities, although disturbance can be for extended periods given the stationary nature of fishing, Adults/juveniles/chicks potentially entangled in discarded fishing line/hooks, Chicks, eggs, adults, juveniles potentially exposed to predation by discarded bait.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 41 If fishing activity is observed disturbing CLTE, visitors will be asked to relocate farther away from nests and fencing will be adjusted, as necessary.
AMM 42 Anglers will continue to be encouraged to properly dispose of fishing lines, hooks, and bait at various locations within the park where trash receptacles are located. CDPR staff will continue to manually remove litter and garbage from beaches.
Park Visitor Activities: Dog Walking (CA-6)
Potential Effects: Similar to pedestrian activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 43 Dogs within the HCP area will continue to be required to be on a leash no longer than 6 feet at all times and within the owner's complete control.
AMM 44 Dogs, other than service dogs, will continue to be banned in the Oso Flaco area.
AMM 45 Waste bag locations will continue to be provided in the HCP area to encourage pet owners to pick up dog waste.
AMM 46 CDPR will continue to enforce dog leash and dog waste regulations, especially in areas where they could impact CLTE. Resource staff monitors and/or park rangers will continue to contact visitors violating park regulations and, where appropriate, rangers will continue to issue a citation.

Table 5-3. Avoidance and Minimization Measures for CLTE
Park Visitor Activities: Equestrian Recreation (CA-7)
Potential Effects: Same as pedestrian activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 47 Horses will continue to be banned in the Oso Flaco area.
Park Visitor Activities: Boating/Surfing (CA-8)
Potential Effects: Foraging/roosting disturbance
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Aerial/Wind-Driven Activities (CA-9)
Potential Effects: Foraging/breeding/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 48 Pursuant to Superintendent's Order (section 1.5.7), CDPR will continue to prohibit kite flying south of the Pier Avenue ramp during the SNPL and CLTE breeding season (March 1 through September 30). AMM 49 Open water kiteboarding/kite surfing, as well as launching and landing, will continue to be prohibited south of Post 6 and dry land launching and landing is only permitted between Pismo Creek and Pier Avenue. AMM 50 All UAS operators will follow the current CDPR policies regarding UAS use. Pursuant to Superintendent's Order (section 1.5.7), CDPR will continue to prohibit public UAS use south of the Pier Avenue ramp during the SNPL and CLTE breeding season (March 1 through September 30).
Park Visitor Activities: Holidays (CA-10)
Potential Effects: Effects for all covered activities on holidays are not expected to be different from those on non-holidays.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 51 Fireworks will continue to be prohibited in the HCP area. AMM 52 CDPR staff or CDPR Volunteers will continue to educate and contact the public during the July 4 holiday period, focusing on areas near the Southern Exclosure to help prevent the use of illegal fireworks over the area.
Park Visitor Activities: Special Events (CA-11)
Potential Effects: Effects based on the specific event activity(ies) permitted (see section 2.2.1.11).
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 53 All permits authorizing special events will continue to include AMMs to reduce disturbance to CLTE. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species. AMM 54 CDPR will continue to monitor special events to ensure participants follow CLTE protective measures. AMM 55 All UAS operators will follow the current CDPR policies regarding UAS use. AMM 56 Specific AMMs for UAS use will be included in special event permits that the UAS operators must obtain from CDPR. For example, non-CDPR UAS will not be allowed near nesting areas south of Post 4.5 during the breeding season and will be limited whenever necessary to avoid impacting CLTE. In addition, a trained CLTE monitor will accompany non-CDPR UAS operators at any time of year if it is determined there is potential to impact covered species. Stable flight paths are preferred to minimize the UAS being perceived as a predator.
Natural Resources Management: CLTE Fencing, Monitoring, and Management (CA-12a and 12b)
Potential Effects: Chicks crushed by vehicle; Breeding/foraging/roosting disturbance; Chicks separated from adult(s) and inadequately fed; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Chicks/eggs abandoned when adults are disturbed, injured, or killed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 57 The seasonal exclosure and symbolic fencing will continue to be installed prior to the March 1 start of the CLTE breeding season. AMM 58 Monitors that enter and walk within the Exclosures and other areas with nests/broods will continue to be those individuals approved by the USFWS and listed on appropriate permits for the covered activities. AMM 59 Single-nest exclosures (minimum 330-foot radius, or other distance based on best available site-specific information and in consultation with Wildlife Agencies) will continue to be erected for nests found in the riding area to help reduce abandonment threat. AMM 60 Fence maintenance and bumpout installation will continue to be timed to avoid high wind periods and other periods deemed critical for chick or nest survival like extreme temperatures. AMM 61 Monitors will continue to escort maintenance vehicles driving through the shoreline closed for nesting. All CDPR staff driving within the closed shoreline area will continue to be trained on how to operate a vehicle on the shoreline when CLTE broods are present to avoid collision or other harm, e.g., scanning in front of vehicle, driving where chicks are less likely to occur, avoiding wrack, and keeping speeds at or below 5 mph.

Table 5-3. Avoidance and Minimization Measures for CLTE	
AMM 62	Monitors will continue to conduct surveys prior to conducting CLTE fence maintenance activities. If nesting CLTE could be impacted by activities, monitors will postpone maintenance, if appropriate. Monitors will continue to remain on site during fence maintenance/ installation activities conducted by hand to monitor nearby nests and minimize disruption to CLTE.
AMM 63	Monitors will continue to remain on site during fence installation to attempt to reduce disturbance that will result in chicks leaving the Southern Exclosure. If any chicks are flushed toward the exclosure boundary or into the open riding area, monitors will continue to follow and protect chicks to keep them in the exclosure and/or until they move back inside the exclosure.
AMM 64	Camera training will continue to be given by staff who are permitted by USFWS to use nest monitoring cameras. Training will continue to occur outside the nesting area and include reading the instruction manual of each camera system, practicing efficient camera installation, and proper placement and concealing of cameras. After the initial training, the trainee will continue to accompany the permitted staff during camera installation on two or more active nests, as well as lead the camera installation while under the guidance of the permitted staff.
AMM 65	Cameras will continue to only be placed if the wind speed is below 15 mph, the sand temperature is below 83°F, and if it is not raining.
AMM 66	Camera set-up will continue to be delayed if there has been a recent sighting of a predator.
AMM 67	Monitors will continue to evaluate whether a nest is a good candidate for predator monitoring prior to installing cameras. Cameras will not be placed in areas where they are readily visible to the public.
AMM 68	Cameras will continue to be installed when the nest has a complete clutch and monitors will stay on site to ensure the adult returns to the nest, when possible. In some instances, as determined by experienced CDPR biologists, a camera needs to be installed prior to the nest having a complete clutch. For example, cameras may be temporarily used to determine nest abandonment.
AMM 69	Trail cameras will continue to be placed approximately 6 feet away from the selected nest, depending on topography and other factors.
AMM 70	Monitors will continue to check nests with cameras daily, using binoculars or a spotting scope to ensure the adult is present and not disturbed by the camera. Monitors will continue to remove the cameras immediately if there is evidence that the placement and/or operation of the camera is jeopardizing the safety of individual nests, eggs, and young.
AMM 71	CLTE nest camera use will continue to follow protocols approved by USFWS.
Potential Effects: Chick mortality/injury during banding; Chicks/eggs crushed by vehicle or monitor; Chicks flushed into the open riding area; Adults killed or injured by striking protective fencing.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 72	CDPR will continue to use appointed staff that have obtained the appropriate state and federal permits for the CLTE breeding season. The permitted staff will continue to be responsible for the banding of CLTE chicks. The permitted staff will continue to work in consultation with and under the direction of the Natural Resource staff. The banding of newly hatched CLTE chicks will continue to follow protocols approved by USFWS and CDFW. The permitted staff will continue to report all banding data and records per guidelines established by the USFWS.
AMM 73	Monitors will continue to only enter and walk within the Southern exclosure and other areas with nests/chicks during appropriate weather conditions (e.g., low to no wind, no rain, outside periods of extreme temperatures). Monitors will also continue to survey for potential predators prior to entering nesting areas and will not enter the area until predators are absent from the area.
AMM 74	Monitors will continue to be aware of the location of nests, chicks, and adults when monitoring within the Southern Exclosure and other areas with nests/chicks, and all efforts will continue to be made to minimize disturbance to reduce the likelihood of adults moving off the nest, chicks moving into the territory of another nest, and/or chicks moving into the open riding area. If any chicks are flushed toward the exclosure boundary or out of the exclosure, monitors will continue to follow and protect chicks to keep them in the exclosure and/or until they move back inside the exclosure.
AMM 75	Monitors will continue to visually check the area under and surrounding any vehicle that has been idle near all nesting areas during the chick-rearing period and in the open riding area to ensure CLTE chicks are not present underneath the vehicle.
AMM 76	The top of the Southern Exclosure fencing will continue to be lined with a strip of thick plastic fencing (orange silt construction fencing cut into approximately 1-foot sections), which will be placed along most of the western and northern fenced areas to increase the fence visibility to flying birds. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip.
AMM 77	Monitors will continue to inspect the integrity of the exclosures regularly.

Table 5-3. Avoidance and Minimization Measures for CLTE	
AMM 78	Monitors will continue to closely survey the east fence of the Southern Exclosure, and other nesting areas that may border the open riding area, when banding or other monitoring activities are taking place on foot inside the fenced area during the chick-rearing period. Any CLTE chicks that move into the riding area will continue to be monitored until they are safely within the protected non-vehicle area and no longer subject to disturbance.
Natural Resources Management: Tidewater Goby and Salmonid Surveys (CA-13)	
Potential Effects: Foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 79	Daily CLTE monitoring during the CLTE breeding season will continue to include areas where fisheries surveys would occur. Fisheries surveys will continue to be adjusted if daily CLTE monitoring determines CLTE foraging and/or breeding would be affected, including postponing surveys if there is a concern of disturbance to CLTE.
AMM 80	Fisheries survey staff will continue to include personnel experienced with conducting fisheries surveys within CLTE habitat and may include permitted CLTE monitors.
Natural Resources Management: Herpetological Monitoring and Management (CA-14)	
Potential Effects: Foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 81	A qualified biologist/Natural Resource staff will continue to survey during the breeding season for foraging or roosting CLTE prior to activities. If foraging or roosting CLTE are observed, activities will be delayed if there is a concern of disturbance to CLTE.
Natural Resources Management: Listed Plant Management Activities (CA-15)	
Potential Effects: Chicks/eggs crushed by vehicle or monitor; Breeding/foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 82	When surveys are necessary during the breeding season and in a known or potential nesting area, one or two experienced biologists will continue to conduct listed plant surveys. Established protocols for the surveys require that any biologist conducting the work be a skilled botanist with experience in identifying the target plant species or be accompanied by a botanist. The biologist must also be a skilled and USFWS-approved CLTE monitor or be accompanied by a biologist with these qualifications.
AMM 83	Prior to conducting botanical surveys, the team will review records of all known CLTE nesting sites in the survey area. No surveys are conducted within 330 feet of known nesting sites until the nest fates are determined (i.e., hatch or fail), and the chicks and attending adult is known to no longer be in the area. No surveys or walking within sight of nests occurs for nests that are close to hatch or newly hatched.
AMM 84	Botanical surveys may be conducted in areas without known nests; however, the team will continue to follow existing nest search protocols to identify new nests, breeding behavior, and the presence of adults tending chicks.
AMM 85	If new nests, breeding behavior, or adults tending chicks are observed in an area during surveys, the team will continue to immediately leave the area until the nest fates are determined or breeding/ chick-rearing activity is no longer occurring in the area.
AMM 86	Botanical surveys will continue to take the minimum time necessary for data collection to avoid disturbance to breeding birds in the area. Botanical surveys will continue to take no longer than 15 minutes at each site with a known population.
AMM 87	All botanical surveys will continue to be conducted under similar constraints as nest search surveys including during appropriate weather conditions, wind conditions, times when predator activity is not occurring, and other precautions per CLTE monitoring protocol in the HCP area.
Natural Resources Management: Habitat Restoration Program (CA-16)	
Potential Effects: Roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Natural Resources Management: Invasive Plant and Animal Control (CA-17)	
Potential Effects: Foraging/roosting disturbance.	
Avoidance and Minimization Measures:	
AMM 88	Invasive plant or animal control will continue to be conducted when CLTE are not observed to be present.
Natural Resources Management: WHPP Implementation (CA-18)	
Potential Effects: Foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Natural Resources Management: Water Quality Monitoring Projects (CA-19)	
Potential Effects: Foraging/roosting disturbance.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	

Table 5-3. Avoidance and Minimization Measures for CLTE
Park Maintenance: General Facilities Maintenance (CA-21)
Potential Effects: Breeding/foraging/roosting disturbance; Chicks/eggs abandoned when adults are disturbed, injured, or killed; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Adults/juveniles/chicks struck by vehicles; Eggs crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 89 CDPR will continue to train park staff and "visiting rangers" annually, or as needed, to ensure that staff are able to do their jobs with minimal impact to CLTE. At a minimum, staff will continue to receive information about basic CLTE biology, listing status, and relevant park rules and regulations and how to respond to observed violations of park rules and regulations that protect CLTE. AMM 90 All CDPR staff will continue to observe closures, speed limits, and other restrictions aimed at protecting CLTE, unless emergency conditions warrant otherwise. AMM 91 CDPR monitors will continue to conduct surveys to ascertain the presence of CLTE nests, adults, and chicks within and adjacent to potential maintenance areas, if such activities must be carried out during the breeding season (March 1 through September 30) in and adjacent to areas where CLTE are potentially nesting, foraging, or roosting. If CDPR monitors finds that the activities may impact, disturb, or result in take of adult birds, chicks, or eggs, the activities will continue to be delayed until the monitor determines CLTE will not be impacted. AMM 92 Mechanical trash removal will not occur in areas when any CLTE are present in the treatment area. AMM 93 Mechanical trash removal will only occur above the high tide, avoid all wrack/surf cast kelp, avoid all live vegetation, and avoid lagoons and flowing creeks. AMM 94 Equipment for trash removal will observe all speed limits and will not exceed 10 mph. AMM 95 Mechanical trash removal will not be conducted within vegetated areas or within any fenced closed areas where known CLTE nesting occurs (such as the Southern Exclosure or any nest buffer). AMM 96 Qualified biologists/Natural Resource staff will inspect and approve the area subject to mechanical trash removal prior to each deployment. Qualified biologists/Natural Resource staff will remain on site or be immediately available for monitoring purposes.
Potential Effects: Limited potential breeding habitat reduced by the footprint of vault toilets.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Trash Control (CA-22)
Potential Effects: Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Wind Fencing Installation, Maintenance, and Removal (CA-23)
Potential Effects: Roosting/breeding disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Sand Ramp and other Vehicular Access Maintenance (CA-24)
Potential Effects: Roosting/breeding disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 97 During the breeding season, the sand ramps will continue to be inspected a minimum of once per day to identify CLTE nests. This will continue to occur during the daily survey.
Park Maintenance: Routine Riparian Maintenance (CA-26)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 98 CLTE will continue to be protected from harm during maintenance activities conducted at the Oceano Lagoon, Pismo Lake, and Oso Flaco Lake through monitoring of the treatment activity by qualified biologists/Natural Resource staff. If any activities are scheduled when CLTE are known to be present (generally between April 15 and September 15) qualified biologists/Natural Resource staff will continue to be on site during activities taking place at these locations. If CLTE are not foraging nearby or biologists observing CLTE foraging activity determine that CLTE will not be disturbed by the activities, it may proceed as planned. However, if CLTE are present and have the potential to be disturbed, the biologist will continue to direct activities to stop within 250 feet of the bird until it leaves on its own accord.
Park Maintenance: Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)
Potential Effects: Foraging/roosting disturbance; Nest disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Heavy Equipment Response in all Areas of SVRA of Oceano Dunes District (CA-29)
Potential Effects: Similar to general facilities maintenance.

Table 5-3. Avoidance and Minimization Measures for CLTE
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Minor Grading (less than 50 cubic yards) (CA-30)[93]
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Boardwalk and Other Pedestrian Access Maintenance (CA-31)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Ranger, Lifeguard, and Park Aide Patrols (CA-32)
Potential Effects: Similar to general facilities maintenance activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Emergency Response (CA-33)
Potential Effects: Similar to general facilities maintenance activities.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 99 Emergency responders will continue to be informed of the locations of areas that are sensitive (e.g., Southern Exclosure, roosting areas), to the extent feasible. If possible, USFWS-approved biologists will escort emergency vehicles into and out of areas that are sensitive.
Visitor Services: Access by Non-CDPR Vehicles (CA-34)
Potential Effects: Adults/juveniles/chicks struck by vehicles; Foraging/roosting disturbance; Chicks/eggs abandoned when adults are disturbed, killed, or injured; Chicks separated from adult(s) and inadequately fed ; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Beach Concessions (CA-36)
Potential Effects: Similar to access by non-CDPR vehicles.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 100 A focused training program will continue to be provided for all concessionaires and OHV rental employees each year. The training program will consist of, at a minimum, a description of CLTE life history and park rules and regulations protecting CLTE. Concessionaires and OHV rental employees will continue to be provided with digital resources consisting of photographs and covered species information. This information will continue to be provided to customers and other members of the public to encourage them to recognize and avoid covered species.
Visitor Services: Natural History and Interpretation Programs (CA-39)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 101 CDPR will continue to hold large group natural history and interpretation programs at Oso Flaco Lake when CLTE are not present or modify the program by observing CLTE behavior to avoid significant disturbance.
Other HCP Covered Activities: Motorized Vehicle Crossing of Creeks (CA-40)
Potential Effects: Adults/juveniles/chicks struck by vehicles; Roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Pismo Creek Estuary Seasonal (floating) Bridge (CA-41)
Potential Effects: Foraging/roosting disturbance.
AMM 102 If, in the opinion of the qualified biologists/Natural Resource staff or monitors, visitor activities are substantially disrupting CLTE foraging and/or roosting behavior, the bridge will be closed to public use until the birds have left the area.
Other HCP Covered Activities: Replacement of the Safety and Education Center (CA-43)
Potential Effects: Chicks/eggs crushed by vehicle.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.

[93] AMMs to reduce the effects of grading to maintain the seasonal exclosure are included in CA-12a: Installation and Maintenance of NPL and CLTE Protection Fence. AMMs to reduce the effects of grading to maintain the boundary fence are included in CA-28: Cable Fence Maintenance and Replacement.

Table 5-3. Avoidance and Minimization Measures for CLTE
Other HCP Covered Activities: Dust Control Activities (CA-44)
Potential Effects: Adults/juveniles/chicks struck by vehicles; Breeding/foraging/roosting disturbance; Eggs crushed; Chicks/eggs abandoned when adults are disturbed, killed, or injured; Chicks separated from adult(s) and inadequately fed; Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed; Adults, juveniles, chicks, eggs more susceptible to predation due to increased vegetation; Breeding/foraging/ roosting habitat altered.
Avoidance and Minimization Measures: All AMMs apply, as appropriate AMM 103 Manage Exclosures to ensure the enclosed area retains the necessary physical and biological characteristics of primary habitat as defined in sections 3.3.1.8 and 3.3.2.8 and as indicated by breeding productivity, including the breeding pair number and fledgling targets in CLTE Objectives 1.1 and 1.2, respectively.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Cultural Resources Management (CA-45)
Potential Effects: Breeding/foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Oso Flaco Lake Boardwalk Replacement (CA-48)
Potential Effects: Foraging/roosting disturbance.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 104 As feasible, boardwalk construction activities will be scheduled when CLTE are unlikely to be present (generally mid-September to mid-April). AMM 105 If boardwalk replacement activities are scheduled when CLTE are known to be present, qualified biologists/Natural Resource staff will monitor construction activities. If CLTE are not foraging nearby or biologists observing CLTE foraging activity determine that CLTE will not be disturbed by the activities, work may proceed as planned. However, if CLTE are present and has the potential to be disturbed, the qualified biologist/Natural Resource staff will continue to direct activities within 250 feet of the CLTE to stop until it leaves on its own accord.
Other HCP Covered Activities: Special Projects (CA-49)
Potential Effects: Breeding/foraging/roosting disturbance; Breeding habitat reduced by footprint of small project.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Reduction of the Boneyard and 6 Exclosures (CA-50)
Potential Effects: Reduction in protected nesting habitat .
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Use of Pesticides (CA-51)
Potential Effects: Breeding/foraging/roosting disturbance; Exposure from contact with contaminated prey or vegetation; Exposure from contact with residues, inhalation of vapors.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 106 When pesticide application must occur near CLTE breeding habitat, work will continue to be conducted between October 1 and February 28 to avoid the SNPL and CLTE breeding season. AMM 107 Pesticides will continue to be applied when wind speeds are below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. AMM 108 Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or NWS forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application. AMM 109 CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats. AMM 110 CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that pesticide application activities do not result in impacts to covered species. AMM 111 If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned up according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements. AMM 112 CDPR will continue to take the following steps when using herbicide: • Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information.

Table 5-3. Avoidance and Minimization Measures for CLTE

- CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made.
- All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

Other HCP Covered Activities: CDPR UAS Use for Park Activities (CA-52)

Potential Effects: Breeding/foraging/roosting disturbance.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Breeding Season - All Flights

AMM 113 UAS will be flown with remote control and a screen that shows battery life. The UAS will be equipped with software or other safeguard to ensure it will alert the operator when it reaches a minimum safe amount of battery life required for a return flight.

AMM 114 UAS operators will attend formal site-specific training or achieve a Remote Pilot Certificate under the FAA's Small UAS Rule (Part 107) and be certified as a Pilot in Command prior to conducting solo flights.

AMM 115 CDPR staff operating UAS will be trained in the safe operation of UAS in the vicinity of nesting or roosting CLTE. Training will include safe practices for takeoff, landing, flights over birds (set flight path, no erratic path that could be mistaken for a predator), minimum height over birds, no turns over nests, preferred operation over waves, and other methods to reduce impacts to nesting or roosting birds.

Breeding Season - Routine Flights

AMM 116 UAS operators will have an established flight plan with a specific purpose determined following all FAA regulations.

AMM 117 UAS will be kept in view of the operator or Visual Observer(s) at all times.

AMM 118 Other than public safety or emergency law enforcement use, UAS operators will not conduct flights in the HCP area without approval from the qualified biologist/Natural Resource staff.

AMM 119 The flight plan will not include erratic flight patterns that could be interpreted as an avian predator by CLTE.

AMM 120 All flights within 328 feet of CLTE nesting or chick-rearing habitat will require a USFWS-approved monitor to pilot or assist with flight logistics and monitoring, regardless if CLTE are confirmed in the area prior to flight.

AMM 121 Prior to flying the UAS into or near (within 328 feet of) nesting or chick-rearing areas, the operator will follow all existing monitoring guidelines that have been established with USFWS.

AMM 122 UAS will not enter or fly within 328 feet of the CLTE nesting areas if the wind speed is above 15 mph or strong enough to move sand (or will be before or after completion of set up and exit from the nesting area), the sand temperature is 83°F, or if it is raining.

AMM 123 UAS flights will be initiated at least 328 feet from the closest known CLTE nest. The take-off and landing area will be clearly marked. If possible, take-off and landing areas will be out of direct sight from known nests.

AMM 124 UAS will only be deployed when a qualified biologist/Natural Resource staff is confident the activity will not jeopardize the safety of CLTE individuals, nests, eggs, and young.

AMM 125 Prior to every UAS flight, a qualified biologist/Natural Resource staff will scan the area for CLTE. If no birds are observed, the UAS flight can commence. The flight operations will be monitored, as appropriate. If a CLTE is observed in the area, it must be monitored by a qualified biologist/Natural Resource staff during the remainder of the flight. If substantial disturbance to a CLTE is observed, they may recommend increasing the altitude of the UAS (but still remain below 400 feet to follow FAA guidelines) and/or guiding the UAS to a safer area.

AMM 126 When CLTE are present in the area of interest, the UAS will fly at the highest possible altitude to collect the necessary data. If any CLTE show an inclination to mob, the UAS will be directed upward (but still below the FAA ceiling of 400 feet) and quickly away from the incoming CLTE. Until a qualified biologist/Natural Resource staff deems the UAS is not a threat to the colony the flight will be aborted.

AMM 127 The UAS will be kept at least 100 feet above the ground at all times to reduce disturbance to nesting birds and below 400 feet to follow FAA guidelines.

Breeding Season – Law Enforcement/Public Safety Flights

AMM 128 Law enforcement UAS training will include advanced training to minimize impacts during emergency response.

AMM 129 In the event of a law enforcement or public safety issue that requires a UAS to be flown in the vicinity of roosting or nesting CLTE, the operator will limit time that UAS are flown in the vicinity of nesting or roosting birds to the maximum extent practical.

AMM 130 If an emergency situation requires the UAS to cross over nesting areas, the UAS will be flown as close to the 400-foot FAA ceiling as possible, and transit the area quickly in a direct path, to avoid disturbance and limit its duration.

Table 5-3. Avoidance and Minimization Measures for CLTE	
	Care will be taken to keep any UAS away from CLTE nesting colony, as their mobbing behavior puts them in danger. A visual observer will always be present to aid in watching for other aircraft and birds.

5.3.1.3 Southwestern Pond Turtle

Most of the AMMs for SWPT are part of the ongoing natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, Oso Flaco boardwalk replacement), and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities for SWPT. The table first lists general AMMs applicable to multiple covered activities and then lists AMMs specific to certain covered activities. Covered activities that do not have effects on SWPT are not listed in the table.

Table 5-4. Avoidance and Minimization Measures for SWPT	
General AMMs	
AMM 1	CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites and social media. Content may include life history information, measures being taken to protect all HCP covered species found at the parks, and the importance of not touching or disturbing covered species. Information will be updated as needed and visitors can visit campground kiosks or interpretive events for additional information such as what they can do to protect the covered species. Covered species information will also be included as part of ongoing interpretative programs.
AMM 2	Posted speed limits will continue to be enforced throughout the HCP area.
AMM 3	Any time CDPR staff note a SWPT that is in harm's way (for example, found on the beach, on a roadway, in a pedestrian path, etc.), that individual may be captured and relocated by a qualified biologist/Natural Resource staff to suitable habitat within the HCP area.
AMM 4	Ground disturbing activities in HCP covered lands, including maintenance activities at the golf course or campgrounds, in known or likely SWPT habitat, will be timed to avoid sensitive life stages including nesting and aestivation periods. As determined by a qualified biologist/Natural Resource staff, pre-activity surveys will be conducted where activities may pose a higher risk due to timing, location, or intensity of activity. If any SWPT are found, activities will be adjusted or postponed until the qualified staff relocates the individual(s) out of harm's way or until they determine the project can proceed with minimal risk to the safety of the individual SWPT or nests. They may also employ protective fencing, rescheduling work times or locations, or other AMM measures where appropriate.
AMM 5	If a SWPT nest is discovered in a location where it may be accessible to visitors, if feasible, qualified biologists/Natural Resource staff will monitor the nest to evaluate whether hatchlings might need protection such as silt fencing barriers to ensure safe passage into suitable habitat. Known nests will be protected with fencing, signage, and/or other appropriate methods, at the discretion of the qualified staff.
AMM 6	Non-emergency activities with the potential to crush dispersing SWPT will be suspended during heavy precipitation events (i.e., at least 0.5 inch of precipitation in a 24-hour period) near potentially occupied SWPT habitat. Activities will be postponed up to 48 hours post precipitation, at the discretion of the qualified biologist/Natural Resource staff.
AMM 7	Per Public Resources Code and CDPR Policy, CDPR will prohibit the release of mosquitofish or any other non-native aquatic organism into aquatic habitat.
AMM 8	Once per year, a qualified biologist/Natural Resource staff will conduct a training session for all CDPR and golf course maintenance personnel, concessions, and lessees. The training, at a minimum, will cover SWPT life history and work constraints. The training session will be repeated for any new personnel at the work site or where conditions at a particular project site warrant additional training.
AMM 9	As part of annual reporting, SWPT sightings will be submitted to CNDDB.
AMM 10	CDPR will continue to implement management measures and modify AMMs in accordance with ongoing adaptive management and based on recommendations found in annual monitoring reports.

Table 5-4. Avoidance and Minimization Measures for SWPT
Park Visitor Activities: Motorized Recreation (CA-1)
Potential Effects: Dispersing individuals struck by vehicles.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Camping (CA-2)
Potential Effects: Dispersing individuals exposed to increased predation due to trash enhancing predator populations, Individual SWPT found or handled by camper, Camper crushing a SWPT nest or burrow.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 11 Trash dumpsters will continue to be provided throughout the HCP area. Trash receptacles are designed to prevent access by potential predators, including covered dumpsters that open from the side and trash bins with lids. CDPR will continue to implement options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. AMM 12 All visitors will continue to be informed they are to deposit their trash in dumpsters/ receptacles provided. All SVRA campers are offered plastic garbage bags. All staff will continue to carry trash bags in each vehicle and make them available to visitors for removing trash and litter from visitor use areas. AMM 13 As staff levels and funding allow, CDPR will continue to manually remove litter and garbage from aquatic areas that could support SWPT.
Park Visitor Activities: Pedestrian Activities (CA-3)
Potential Effects: Nest damaged or destroyed; hatchlings disturbed or crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Fishing (CA-5)
Potential Effects: Disturbance to nesting, basking, and aquatic foraging, Increased exposure to predators, Increased chances for fishing line entanglement.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 14 CDPR will restrict fishing activities from occurring near known SWPT nests. AMM 15 CDPR will incorporate considerations for SWPT, which includes encouraging and educating anglers about properly disposing of fishing lines, hooks, and bait in trash receptacles.
Park Visitor Activities: Dog Walking (CA-6)
Potential Effects: Individuals disturbed; Individuals exposed to increased turbidity; Water quality decreased by depositing waste and/or trampling vegetation; Individuals exposed to increased predation; Foraging activities and reproductive success reduced.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 16 Dogs will continue to be required to be on a leash no longer than 6 feet at all times and under complete control of the owner within the HCP area. AMM 17 Waste bags will continue to be provided in the HCP area to encourage pet owners to pick up dog waste. AMM 18 As funding and staff time are available, CDPR will continue to manually remove litter and garbage from SWPT habitat.
Park Visitor Activities: Equestrian Recreation (CA-7)
Potential Effects: Nest damaged or destroyed; Hatchlings disturbed or crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Holidays (CA-10)
Potential Effects: Effects for all covered activities on holidays are not expected to be different from those on non-holidays.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Visitor Activities: Special Events (CA-11)
Potential Effects: Effects based on the specific event activity(ies) permitted, but similar to motorized recreation (CA-1), camping (CA-2), and pedestrian activities (CA-3).

Table 5-4. Avoidance and Minimization Measures for SWPT
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 19 All permits authorizing special events will include AMMs to reduce disturbance to SWPT. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
Natural Resources Management: Tidewater Goby and Salmonid Survey (CA-13)
Potential Effects: Individuals disturbed/injured/captured; Nests/eggs damaged/destroyed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 20 A visual survey for SWPT will be conducted during sampling in areas where SWPT may be present. If SWPT are present, surveys will either be postponed until a qualified biologist/Natural Resource staff relocates the individual, or will continue if in their opinion, surveys can be conducted with minimal impact to the safety of individual SWPT.
AMM 21 If SWPT are incidentally captured during surveys, they will be checked for injury and released immediately at the capture site. This information will be included in the annual report to USFWS.
AMM 22 If SWPT are injured or killed during surveys, it will be reported to the USFWS as part of the annual report or through the reporting for the USFWS Recovery Permit.
AMM 23 To reduce predation from invasive species, qualified biologists/Natural Resource staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrogs, largemouth bass, red-eared sliders, crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on SWPT.
AMM 24 CDPR will continue to monitor populations of invasive predators during fisheries, herpetological surveys and SWPT surveys. As needed, CDPR will control invasive predators to offset impacts as outlined in the SWPT Goals and Objectives (section 5.2.4).
Potential Effects: Individuals exposed to increased risk of disease.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 25 Surveyors will continue to follow the USFWS Recommended Equipment Decontamination Procedures, which provides guidance for disinfecting equipment and clothing after entering a pond and before entering an aquatic resource.
Natural Resources Management: Herpetological Monitoring and Management (CA-14)
Potential Effects: Individuals disturbed/injured/captured; Individuals exposed to increased risk of spread of disease.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 26 If SWPT is listed, CDPR will amend the USFWS Recovery Permit to include surveys and management activities for SWPT.
AMM 27 A USFWS-approved biologist will continue to conduct CRLF surveys in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF and will follow all USFWS SWPT survey guidance upon issuance. Surveyors will also be trained in the identification and avoidance measures of SWPT.
Natural Resources Management: Listed Plant Management Activities (CA-15)
Potential Effects: Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
AMM 28 Best Management Practices will be employed where needed to reduce turbidity from work in aquatic habitat.
AMM 29 Any time a work activity will need to be conducted on the bed, banks, or channel of aquatic habitat with the potential to support SWPT, appropriate steps will continue to be taken to minimize turbidity from activities. If possible, activities will continue to be conducted from outside the wetted area or from stream banks or other upland areas. If activity is necessary in wetted areas, work will continue to be limited to the minimum necessary to achieve desired outcome and care will be taken to reduce turbidity, especially during critical periods like during hatchling emergence or hatchlings presence in the water.
Potential Effects: Individuals and/or nest disturbed.
AMM 30 If a SWPT is found within 100 feet of plant management activities in SWPT habitat, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue if they determine the activities can continue with minimal risk to the safety of individual SWPT. They may also employ exclusion fencing, biological monitoring, and/or other measures where appropriate.
Natural Resources Management: Habitat Restoration Program (CA-16)
Potential Effects: Individuals exposed to increased turbidity, Individuals and/or nests disturbed/injured/destroyed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Natural Resources Management: Invasive Plant and Animal Control (CA-17)
Potential Effects: Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Table 5-4. Avoidance and Minimization Measures for SWPT
Potential Effects: Individuals and/or nests disturbed/injured/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 31 As funding and staff resources allow, CDPR will continue to eradicate or reduce the cover, biomass, and distribution of non-native invasive plants to enhance CRLF and SWPT habitat. Routine vegetation management will continue to occur at Oso Flaco area, Oceano Lagoon and Lagoon Trail, Meadow Creek, and Pismo Lake spillway. Other areas where vegetation management may occur include Arroyo Grande Creek and Estuary and dune lakes and wetlands. Vegetation management also includes removal of emergent vegetation and debris, as necessary to improve potential CRLF habitat, which will also improve SWPT habitat.
Natural Resources Management: Water Quality Monitoring Projects (CA-19)
Potential Effects: Individuals exposed to increased turbidity; Individuals and/or nests disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Campground Maintenance (CA-20)
Potential Effects: Dispersing individuals crushed/injured.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 32 Mowing of campgrounds and golf course will be limited to the maximum area necessary to provide for safe public access and limited to public use areas. Care will be taken to avoid mowing wetland areas, wetland vegetation, and in proximity to riparian vegetation to avoid potential burrows or nests. Mowing in ways that reduce mortality or injury will also be considered such as adjusting blade heights and mowing outside of nesting times when SWPT are searching for nesting sites (May-July, typically in the early afternoon) or when hatchlings are making their way to the water (late February/early March). Mowing activities will be adjusted as new information becomes available on the dispersal and habits of SWPT in the covered lands. AMM 33 If a SWPT is observed during maintenance activities, the activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue if they determine the activities can continue with minimal risk to the safety of individual SWPT. They may also employ exclusion fencing, biological monitoring, and/or other measures where appropriate.
Park Maintenance: General Facilities Maintenance (CA-21)
Potential Effects: Dispersing individuals crushed/injured.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Routine Riparian Maintenance (CA-26)
Potential Effects: Individuals and nests crushed/injured/disturbed.

Table 5-4. Avoidance and Minimization Measures for SWPT
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 34 Culvert maintenance will be conducted outside of the oviposition/nest construction season and the hatchling emergence season, to the extent feasible. AMM 35 As determined by a qualified biologist/Natural Resource staff, pre-activity surveys will be conducted no more than 2 days before the onset of activities associated with projects within suitable habitat for SWPT (e.g., culvert maintenance). If any SWPT life stage is found, work will not commence until AMMs are implemented, including relocation, exclusion fencing, and/or monitoring. AMM 36 As determined by a qualified biologist/Natural Resource staff, a SWPT monitor will be on site during maintenance associated with projects within suitable habitat for SWPT (e.g., culvert maintenance). If SWPT is detected within the project area, work will stop until the animal is no longer present or until appropriate AMMs are implemented. AMMs can include such measures as relocation, exclusion fencing with additional monitoring to prevent take along fenceline, and/or biological monitoring during maintenance activities. AMM 37 SWPT life-stages found in the work area will be relocated upon determination by the qualified biologist/Natural Resource staff that an appropriate relocation site exists, and relocation is the preferred avoidance method. Qualified staff will be allowed sufficient time to move SWPT from the work site before activities begin. Only those qualified will participate in activities associated with capturing, handling, and monitoring SWPT. They will follow safe-handling practices as outlined in the Declining Amphibians Population Task Force Code of Practice. AMM 38 Heavy equipment will continue to be operated from the roadside or upper banks and will not be placed in the water body during culvert maintenance. Backhoe work will continue to be restricted to the roadside or upper bank and only the bucket may be placed in the water body. AMM 39 CDPR staff will continue to limit the amount of disturbance to vegetation, banks, and streambed. Work and entrance into the work area will continue to be restricted to established areas. AMM 40 All refueling, maintenance, and staging of equipment and vehicles will continue to occur at least 60 feet from riparian habitat and water bodies in a location where a spill will not drain directly toward aquatic habitat. AMM 41 All vehicles and equipment will continue to be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Prior to the start of maintenance activities, all equipment will continue to be inspected for leaks. AMM 42 A spill plan will continue to be in place for prompt and effective response to an accidental spill. The spill plan will continue to include, at a minimum, immediately notifying the biologist of any hazardous spills and immediately cleaning up spills. All Park staff will continue to be informed of the importance of preventing spills and appropriate measures to take when a spill happens. AMM 43 All equipment and vehicles under-carriages will continue to be inspected periodically. Equipment that has been parked near potentially occupied SWPT habitat will be re-inspected prior to moving.
Potential Effects: Individuals exposed to increased predation.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Potential Effects: Individuals exposed to increased turbidity; Individuals exposed to increased risk of spread of disease; Temporary disturbance of approximately 0.3 acre of wetlands.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Boardwalk and Other Pedestrian Access Maintenance (CA-31)
Potential Effects: Individuals disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 44 Crews will continue to use hand tools to trim all vegetation.
Visitor Services: Emergency Response (CA-33)
Potential Effects: Individuals struck by vehicles, Breeding and/or dispersal habitat damaged, Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and appropriate.
Visitor Services: Access by Non-CDPR Vehicles (CA-34)
Potential Effects: Individuals struck by vehicles, Breeding and/or dispersal habitat damaged, Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and appropriate.
Visitor Services: Pismo State Beach Golf Course Operations (CA-37)
Potential Effects: Dispersing individuals injured/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Table 5-4. Avoidance and Minimization Measures for SWPT
Potential Effects: Individuals struck by vehicles; Individuals disturbed; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 45 Even though Pismo/Carpenter and Oso Flaco Creeks are closed to the public, CDPR and contractors must still drive across these creeks. CDPR staff will continue to periodically review conditions and identify any issues that may result from vehicle crossings in areas where there is ponded water. If, in the opinion of a qualified biologist/Natural Resource staff, a vehicle crossing would present a threat to any life stages of SWPT, staff will close this access until conditions have changed. AMM 46 When tidal action or stream flow increase ponded areas within Arroyo Grande Creek and Estuary, CDPR will regularly inspect and modify fences to prevent all vehicle activity in ponded water.
Other HCP Covered Activities: Pismo Creek Estuary Seasonal (floating) Bridge (CA-41)
Potential Effects: Individuals disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Dust Control Activities (CA-44)
Potential Effects: Nesting and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Cultural Resources Management (CA-45)
Potential Effects: Nesting and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: CDPR Management of Agricultural Lands (CA-46)
Potential Effects: Nesting and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Oso Flaco Lake Boardwalk Replacement (CA-48)
Potential Effects: Same as riparian maintenance activities, Potential loss of aquatic habitat, Disturbance from construction noise, including pile driving; Individuals exposed to increased turbidity; Water quality decreased
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 47 Before any project activities occur, a qualified biologist/Natural Resource staff will conduct a training session for all construction personnel. At a minimum, the training will include a description of the SWPT and its habitat, the importance of the SWPT and its habitat, the general measures that are being implemented to conserve the SWPT as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session, provided a qualified person is on hand to answer any questions. AMM 48 The construction footprint will be limited as much as possible, with all construction areas including access and staging areas clearly demarcated. AMM 49 As feasible, boardwalk replacement will be constructed during a period when nesting is unlikely to occur in the project area. A USFWS-approved biologist will survey the work site ≤2 days before the onset of activities. If SWPT adults, juveniles, or eggs are found, work will not commence until avoidance measures are in place. AMM 50 Any SWPT life-stages found in the project work area may be relocated upon determination by the qualified biologist/Natural Resource staff that an appropriate relocation site exists and relocation is the preferred avoidance method. They will be allowed sufficient time to move SWPT from the work site before work activities begin. Only those qualified will participate in activities associated with the capture, handling, and monitoring of SWPT. AMM 51 A qualified biologist/Natural Resource staff will be present at the work site, as needed, or until the removal of all SWPT, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor on-site compliance with all minimization measures. The qualified biologist/Natural Resource staff will ensure that this individual receives training. The training, at a minimum, will cover identification and life history of SWPT and work constraints. The monitor and the qualified biologist/Natural Resource staff will have the authority to halt any action that might result in impacts that exceed the levels anticipated by the USFWS. AMM 52 As practical, pile driving will always use a soft start procedure. The soft start would include an initial set of three strikes from the impact hammer at reduced energy, followed by a 1-minute waiting period. This process will be repeated a total of three times prior to initiation of pile driving. Soft start is required for any impact driving, including at the beginning of the day and at any time following a cessation of impact pile driving of 30 minutes or longer. AMM 53 Whenever feasible, a vibratory hammer will be used. AMM 54 CDPR will comply with all permit requirements, including best management practices to minimize sediment impacts.
Other HCP Covered Activities: Special Projects (CA-49)

Table 5-4. Avoidance and Minimization Measures for SWPT	
Potential Effects: Permanent and/or temporary loss of breeding or upland habitat; Individuals crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Other HCP Covered Activities: Use of Pesticides **(CA-51)**	
Potential Effects: Disturbance of habitat; Exposure from contact with contaminated prey or vegetation; Exposure from contact with residues, inhalation of vapors.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 55	Any application of herbicide or pesticide in aquatic habitat will be consistent with the Aquatic Pesticide Application Plan (APAP) and will be designed to achieve control of pests or exotic species while protecting water quality and aquatic organisms.
AMM 56	When pesticide application must occur near SWPT breeding habitat, a qualified biologist/Natural Resource staff will conduct a survey for SWPT as practical prior to the application and will instruct the work crew on their identification and biology. If SWPT is observed, all work will cease immediately until the qualified biologist/Natural Resource staff arrives and assesses the situation to determine if the work can proceed.
AMM 57	As operationally feasible and at the discretion of trained SWPT monitors, herbicide application will not occur within suitable nesting habitat (and SWPT travel corridors between suitable nesting and aquatic habitat) during the SWPT oviposition/nest construction season (generally May 15–July 31) and the hatchling emergence season (generally March 1–April 30 as well as August 1–September 30).
AMM 58	Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side.
AMM 59	Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or NWS forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application.
AMM 60	CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats.
AMM 61	CDPR will continue to ensure that qualified personnel are present at key phases of the work to ensure that pesticide application activities do not result in impacts to covered species.
AMM 62	If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements.
AMM 63	Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information.
AMM 64	CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made.
AMM 65	All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.1.4 California Red-Legged Frog

The majority of AMMs for CRLF are part of the ongoing natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, Oso Flaco boardwalk replacement) and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities for CRLF. The table first lists general AMMs applicable to multiple covered activities and then lists AMMs specific to certain covered activities. Covered activities that do not have effects on CRLF are not listed in the table.

Table 5-5. Avoidance and Minimization Measures for CRLF

General AMMs

AMM 1 CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites and social media. Content may include life history information, measures being taken to protect all HCP covered species found at the parks, and the importance of not touching or disturbing covered species. Information will be updated as needed and visitors can visit campground kiosks or interpretive events for additional information such as what they can do to protect the covered species. Covered species information will also be included as part of ongoing interpretative programs.

AMM 2 Posted speed limits will continue to be enforced throughout the HCP area.

AMM 3 Any time CDPR staff note a CRLF that is in harm's way (for example, found on the beach, on a roadway, in a pedestrian path, etc), that individual may be captured and relocated by a qualified biologist/Natural Resource staff to suitable habitat within the HCP area.

AMM 4 Ground disturbing activities in HCP covered lands, including maintenance activities at the golf course or campgrounds, in known or likely CRLF habitat, will be timed to avoid aestivating or dispersing CRLF. As determined by a qualified biologist/Natural Resource staff, pre-activity surveys will be conducted where activities may pose a higher risk due to timing, location, or intensity of activity. If any CRLF are found, activities will be adjusted or postponed until a USFWS-approved biologist relocates the individual(s) out of harm's way or until they determine the project can proceed with minimal risk to the safety of the individual CRLF. The biologist may also employ protective fencing, rescheduling work times or locations, or other AMM measures where appropriate.

AMM 5 Non-emergency activities with the potential to crush dispersing CRLF will be suspended during heavy precipitation events (i.e., at least 0.5 inches of precipitation in a 24-hour period) near potentially occupied CRLF habitat. Activities will be postponed up to 48 hours post precipitation, at the discretion of the qualified biologist/Natural Resource staff.

AMM 6 Per Public Resources Code and CDPR Policy, CDPR will prohibit the release of mosquitofish or any other non-native aquatic organism into aquatic habitat.

AMM 7 Once per year, a qualified biologist/Natural Resource staff will conduct a training session for all CDPR and golf course maintenance personnel, concessions, and lessees. The training, at a minimum, will cover CRLF life history and work constraints. The training session will be repeated for any new personnel at the work site or where conditions at a particular project site warrant additional training.

AMM 8 As part of annual reporting, CRLF sightings will be submitted to CNDDB.

AMM 9 CDPR will continue to implement management measures and modify AMMs in accordance with ongoing adaptive management and based on recommendations found in annual monitoring reports.

Park Visitor Activities: Motorized Recreation (CA-1)

Potential Effects: Dispersing individuals struck by vehicles.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Park Visitor Activities: Camping (CA-2)

Potential Effects: Dispersing individuals exposed to increased predation due to trash enhancing predator populations; Individual CRLF found or handled by camper; Camper crushing a CRLF.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

AMM 10 Trash dumpsters will continue to be provided throughout the HCP area. Trash receptacles are designed to prevent access by potential predators, including covered dumpsters that open from the side and trash bins with lids. CDPR will continue to implement options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites.

AMM 11 All visitors will continue to be informed they are to deposit their trash in dumpsters/ receptacles provided. All SVRA campers are offered plastic garbage bags. All staff will continue to carry trash bags in each vehicle and make them available to visitors for removing trash and litter from visitor use areas.

AMM 12 As staff levels and funding allow, CDPR will continue to manually remove litter and garbage from aquatic areas that could support CRLF.

Park Visitor Activities: Pedestrian Activities (CA-3)

Potential Effects: Individuals exposed to increased turbidity.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

AMM 13 CDPR will continue to monitor the Carpenter Creek, Pismo Creek, and any other pedestrian water crossing locations for CRLF. If CRLF are observed in or near locations where pedestrians are known to cross and deemed vulnerable to pedestrian activity as determined by a qualified biologist/Natural Resource staff, CDPR will continue to

Table 5-5. Avoidance and Minimization Measures for CRLF
post signs closing crossings and/or encourage use of other paths in the HCP area, depending on the intensity of disturbance.
Park Visitor Activities: Dog Walking (CA-6)
Potential Effects: Individuals disturbed; Individuals exposed to increased turbidity; Water quality decreased by depositing waste and/or trampling vegetation; Individuals exposed to increased predation; Foraging activities and reproductive success reduced.
Avoidance and Minimization Measures: All AMMs apply, as appropriate AMM 14 Dogs will continue to be required to be on a leash no longer than 6 feet at all times and under complete control of the owner within the HCP area. AMM 15 Waste bags will continue to be provided in the HCP area to encourage pet owners to pick up dog waste. AMM 16 As funding and staff time are available, CDPR will continue to manually remove litter and garbage from CRLF habitat.
Park Visitor Activities: Equestrian Recreation (CA-7)
Potential Effects: Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate
Park Visitor Activities: Holidays (CA-10)
Potential Effects: Effects for all covered activities on holidays are not expected to be different from those on non-holidays.
Avoidance and Minimization Measures: All AMMs apply, as appropriate
Park Visitor Activities: Special Events (CA-11)
Potential Effects: Effects based on the specific event activity(ies) permitted, but similar to motorized recreation (CA-1), camping (CA-2), and pedestrian activities (CA-3).
Avoidance and Minimization Measures: All AMMs apply, as appropriate AMM 17 All permits authorizing special events will continue to include AMMs to reduce disturbance to CRLF. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
Natural Resources Management: Tidewater Goby and Salmonid Surveys (CA-13)
Potential Effects: Individuals disturbed/injured/captured, Egg masses damaged
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 18 A visual survey for CRLF and CRLF egg masses will continue to be conducted prior to sampling in areas where CRLF may be present. If CRLF are present, surveys will be postponed until a qualified biologist/Natural Resource staff determines they can safely proceed, including by implementing appropriate AMMs. If egg masses are present, sampling will continue to be postponed until the eggs have hatched or the survey will continue to be conducted to avoid all egg masses. AMM 19 If CRLF are incidentally captured during surveys, they will be checked for injury and released immediately at the capture site. This information will continue to be included in the annual report to USFWS. AMM 20 Prior to activities that may involve handling CRLF, the surveyor(s) will continue to ensure that hands are free of sunscreens, lotion, nicotine, and insect repellent. AMM 21 If CRLF are injured or killed during surveys, it will be reported to the USFWS as part of the annual report or through the USFWS Recovery Permit. AMM 22 To reduce predation from invasive species, qualified CDPR staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrogs, largemouth bass, red-eared sliders, crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on CRLF. AMM 23 CDPR will continue to monitor populations of invasive predators during fisheries, herpetological surveys and CRLF surveys. As needed, CDPR will control invasive predators to offset impacts as outlined in the CRLF Goals and Objectives (section 5.2.5). AMM 24 CDPR will continue to prohibit the release of mosquitofish into any known or potential CRLF breeding habitat.
Potential Effects: Individuals exposed to increased risk of disease.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 25 Surveyors will continue to follow the USFWS Recommended Equipment Decontamination Procedures, which provides guidance for disinfecting equipment and clothing after entering a pond and before entering an aquatic resource.
Natural Resources Management: Herpetological Monitoring and Management (CA-14)
Potential Effects: Individuals disturbed/injured/captured; Egg masses damaged; Individuals exposed to increased risk of spread of disease.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Table 5-5. Avoidance and Minimization Measures for CRLF	
AMM 26	A USFWS-approved biologist will continue to conduct CRLF surveys in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF.
Natural Resources Management: Listed Plant Management Activities (CA-15)	
Potential Effects: Individuals exposed to increased turbidity.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 27	Best Management Practices will be employed where needed to reduce turbidity from work in aquatic habitat.
AMM 28	Any time a work activity will need to be conducted on the bed, banks, or channel of aquatic habitat with the potential to support CRLF, appropriate steps will continue to be taken to minimize turbidity from activities. If possible, activities will continue to be conducted from outside the wetted area or from stream banks or other upland areas. If activity is necessary in wetted areas, work will continue to be limited to the minimum necessary to achieve desired outcome and care will be taken to reduce turbidity, especially during critical periods like when egg masses or tadpoles are present in the water.
Potential Effects: Individuals and/or egg masses disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 29	Depending on the type of activity (e.g., ground disturbance) and at the discretion of a qualified biologist/Natural Resource staff, immediately prior to the start of listed plant management activities near potentially occupied CRLF habitat, surveys for CRLF will be conducted up to 100 feet outside the project boundaries.
AMM 30	If a CRLF is found within 100 feet of plant management activities in CRLF habitat, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue if they determine the activities can continue with minimal risk to the safety of individual CRLF. They may also employ exclusion fencing, biological monitoring and/or other measures where appropriate.
Natural Resources Management: Habitat Restoration Program (CA-16)	
Potential Effects: Individuals exposed to increased turbidity; Individuals and or egg masses disturbed/injured/destroyed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Natural Resources Management: Invasive Plant and Animal Control (CA-17)	
Potential Effects: Individuals exposed to increased turbidity; Individuals and or egg masses disturbed/injured/captured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 31	As funding and staff resources allow, CDPR will continue to eradicate or reduce the cover, biomass, and distribution of non-native invasive plants to enhance CRLF habitat. Routine vegetation management will continue to occur at Oso Flaco area, Oceano Lagoon and Lagoon Trail, Meadow Creek, and Pismo Lake spillway. Other areas where vegetation management may occur include Arroyo Grande Creek and Estuary and dune lakes and wetlands. Vegetation management also includes removal of emergent vegetation and debris, as necessary to improve potential CRLF habitat.
Natural Resources Management: Water Quality Monitoring Projects (CA-19)	
Potential Effects: Individuals exposed to increased turbidity; Individuals and/or egg masses disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 32	CDPR will continue to work with public agencies, landowners, and stakeholders to secure a sustained water inflow into the estuary, focused on sustainable groundwater use and maintenance of instream flows in the lower mile of Arroyo Grande Creek.
AMM 33	CDPR will work with the County on their operations and maintenance of the Sand Canyon Flapgate to minimize impacts to CRLF from sediment, invasive aquatic species, and other similar threats.
Park Maintenance: Campground Maintenance (CA-20)	
Potential Effects: Dispersing individuals crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 34	Mowing of campgrounds and golf course will be limited to the maximum area necessary to provide for safe public access and limited to public use areas. Care will be taken to avoid mowing wetland areas, wetland vegetation, and in proximity to riparian vegetation to avoid aestivating or dispersing CRLF. Mowing activities will be adjusted as new information becomes available on the dispersal and habits of CRLF in the covered lands.
AMM 35	If a CRLF is observed during maintenance activities, the activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or will continue if they determine the activities can continue with minimal risk to the safety of individual CRLF. They may also employ exclusion fencing, biological monitoring, and/or other measures where appropriate.
Park Maintenance: General Facilities Maintenance (CA-21)	
Potential Effects: Individuals and egg masses crushed/injured/disturbed.	

Table 5-5. Avoidance and Minimization Measures for CRLF
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Routine Riparian Maintenance (CA-26)
Potential Effects: Individuals and egg masses crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 36 Culvert maintenance will continue to be conducted during periods when egg masses or larvae are unlikely to occur in the project area (e.g., low flow period), to the extent feasible. AMM 37 A USFWS-approved biologist/Natural Resource staff will conduct focused surveys of the work sites no more than 2 weeks before the onset of activities associated with projects within suitable habitat for CRLF (e.g., culvert maintenance). If CRLF adults, tadpoles, or eggs are found, work will not commence until AMMs are in place. AMM 38 As determined by a USFWS-approved biologist/Natural Resource staff, qualified staff will be on site during maintenance associated with projects within suitable habitat for CRLF (e.g., culvert maintenance). If CRLF is detected within the project area, work will stop until CRLF is no longer present or until appropriate AMMs are in place. AMMs can include such measures as relocation, exclusion fencing with additional monitoring to prevent take along fenceline, and/or biological monitoring during maintenance activities. AMM 39 CRLF life-stages found in the work area will be relocated upon determination by the USFWS-approved biologist/Natural Resource staff that an appropriate relocation site exists and relocation is the preferred avoidance method. The biologist will be allowed sufficient time to move CRLF from the work site before activities begin. Only USFWS-approved biologists will participate in activities associated with capturing, handling, and monitoring CRLF. The biologists will follow safe-handling practices as outlined in the Declining Amphibians Population Task Force Code of Practice. AMM 40 Heavy equipment will continue to be operated from the roadside or upper banks and will not be placed in the water body during culvert maintenance. Backhoe work will continue to be restricted to the roadside or upper bank and only the bucket may be placed in the water body. AMM 41 CDPR staff will continue to limit the amount of disturbance to vegetation, banks, and streambed. Work and entrance into the work area will continue to be restricted to established areas. AMM 42 All refueling, maintenance, and staging of equipment and vehicles will continue to occur at least 60 feet from riparian habitat and water bodies in a location where a spill will not drain directly toward aquatic habitat. AMM 43 All vehicles and equipment will continue to be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Prior to the start of maintenance activities, all equipment will continue to be inspected for leaks. AMM 44 A spill plan will continue to be in place for prompt and effective response to an accidental spill. The spill plan will continue to include, at a minimum, immediately notifying the biologist of any hazardous spills and immediately cleaning up spills. All Park staff will continue to be informed of the importance of preventing spills and appropriate measures to take when a spill happens. AMM 45 All equipment and vehicles under-carriages will continue to be inspected periodically. Equipment that has been parked near potentially occupied CRLF habitat will be re-inspected prior to moving.
Potential Effects: Individuals exposed to increased predation.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Potential Effects: Individuals exposed to increased turbidity, Individuals exposed to increased risk of spread of disease; Temporary disturbance of approximately 0.3 acre of wetlands.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Boardwalk and Other Pedestrian Access Maintenance (CA-31)
Potential Effects: Individuals disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 46 Crews will continue to use hand tools to trim all vegetation.
Visitor Services: Emergency Response (CA-33)
Potential Effects: Individuals struck by vehicles; Breeding and/or dispersal habitat damaged; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and appropriate.
Visitor Services: Access by Non-CDPR Vehicles (CA-34)
Potential Effects: Individuals struck by vehicles; Breeding and/or dispersal habitat damaged; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and appropriate.
Visitor Services: Pismo State Beach Golf Course Operations (CA-37)
Potential Effects: Dispersing individuals injured/crushed.

Table 5-5. Avoidance and Minimization Measures for CRLF
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Grover Beach Lodge and Conference Center (CA-38)
Potential Effects: Dispersing individuals injured/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
Potential Effects: Individuals struck by vehicles; Individuals disturbed; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 47 Even though Pismo/Carpenter and Oso Flaco Creeks are closed to the public, CDPR and contractors must still drive across these creeks. CDPR staff will continue to periodically review conditions and identify any issues that may result from vehicle crossings in areas where there is ponded water. If, in the opinion of a qualified biologist/Natural Resource staff, a vehicle crossing would present a threat to any life stages of CRLF, staff will close this access until conditions have changed. AMM 48 When tidal action or stream flow increase ponded areas within Arroyo Grande Creek and Estuary, CDPR will regularly inspect and modify fences to prevent all vehicle activity in ponded water.
Other HCP Covered Activities: Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)
Potential Effects: Individuals disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Dust Control Activities (CA-44)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Cultural Resources Management (CA-45)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: CDPR Management of Agricultural Lands (CA-46)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Maintenance of Bioreactor on Agricultural Lands (CA-47)
Potential Effects: Individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Oso Flaco Lake Boardwalk Replacement (CA-48)
Potential Effects: Same as riparian maintenance activities; Potential loss of aquatic habitat; Disturbance from construction noise, including pile driving; Individuals exposed to increased turbidity; Water quality decreased
Avoidance and Minimization Measures: All AMMs apply, as appropriate AMM 49 Before any project activities occur, a USFWS-approved biologist/Natural Resource staff will conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and its habitat, the importance of the CRLF and its habitat, the general measures that are being implemented to conserve the CRLF as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session, provided a qualified person is on hand to answer any questions. AMM 50 The construction footprint will be limited as much as possible, with all construction areas including access and staging areas clearly demarcated. AMM 51 As feasible, boardwalk replacement will be constructed during a period when egg masses are unlikely to occur in the project area. A USFWS-approved biologist will survey the work site within 1 week before the onset of activities. If CRLF adults, tadpoles, or eggs are found, work will not commence until avoidance measures are in place. AMM 52 Any CRLF life-stages found in the project work area may be relocated upon determination by the USFWS-approved biologist that an appropriate relocation site exists and relocation is the preferred avoidance method. The approved biologist will be allowed sufficient time to move CRLF from the work site before work activities begin. Only USFWS-approved biologists will participate in activities associated with the capture, handling, and monitoring of CRLF. AMM 53 A USFWS-approved biologist will be present at the work site until the removal of all CRLF, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor on-site compliance with all minimization measures. The USFWS-approved biologist will ensure that this individual receives training. The training, at a minimum, will cover identification and life history or CRLF and work

Table 5-5. Avoidance and Minimization Measures for CRLF	
	constraints. The monitor and the USFWS-approved biologist will have the authority to halt any action that might result in impacts that exceed the levels anticipated by the USFWS.
AMM 54	As practical, pile driving will always use a soft start procedure. The soft start would include an initial set of three strikes from the impact hammer at reduced energy, followed by a 1-minute waiting period. This process will be repeated a total of three times prior to initiation of pile driving. Soft start is required for any impact driving, including at the beginning of the day and at any time following a cessation of impact pile driving of 30 minutes or longer.
AMM 55	Whenever feasible, a vibratory hammer will be used.
AMM 56	CDPR will comply with all permit requirements, including best management practices to minimize sediment impacts.
Other HCP Covered Activities: Special Projects **(CA-49)**	
Potential Effects: Permanent and/or temporary loss of upland habitat; Individuals crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Other HCP Covered Activities: Use of Pesticides **(CA-51)**	
Potential Effects: Disturbance of habitat; Exposure from contact with contaminated prey or vegetation; Exposure from contact with residues, Inhalation of vapors.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 57	Any application of herbicide or pesticide in aquatic habitat will be consistent with the Aquatic Pesticide Application Plan (APAP) and will be designed to achieve control of pests or exotic species while protecting water quality and aquatic organisms.
AMM 58	When pesticide application must occur near CRLF breeding habitat, a qualified biologist/Natural Resource staff will conduct a survey for CRLF as practical prior to the application and will instruct the work crew on their identification and biology. If CRLF is observed, all work will cease immediately until the qualified staff arrives and assesses the situation to determine if the work can proceed.
AMM 59	Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side.
AMM 60	Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or NWS forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application.
AMM 61	CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats.
AMM 62	CDPR will continue to ensure that qualified personnel are present at all phases of the work to ensure that pesticide application activities do not result in impacts to covered species.
AMM 63	If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements.
AMM 64	Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information.
AMM 65	CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made.
AMM 66	All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.1.5 Western Spadefoot

Most of the AMMs for western spadefoot are part of the ongoing natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, Oso Flaco boardwalk replacement), and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities for western spadefoot. The table first lists general AMMs applicable to multiple

covered activities and then lists AMMs specific to certain covered activities. Covered activities that do not have effects on western spadefoot are not listed in the table.

Table 5-6. Avoidance and Minimization Measures for WSF

General AMMs

AMM 1 CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites and social media. Content may include life history information, measures being taken to protect all HCP covered species found at the parks, and the importance of not touching or disturbing covered species. Information will be updated as needed and visitors can visit campground kiosks or interpretive events for additional information such as what they can do to protect the covered species. Covered species information will also be included as part of ongoing interpretative programs.

AMM 2 Posted speed limits will continue to be enforced throughout the HCP area.

AMM 3 Any time CDPR staff note a WSF that is in harm's way (for example, found on the beach, on a roadway, in a pedestrian path, etc), that individual may be captured and relocated by a qualified biologist/Natural Resource staff to suitable habitat within the HCP area.

AMM 4 Ground disturbing activities in HCP covered lands, including maintenance activities at the golf course or campgrounds, in known or likely WSF habitat, will be timed to avoid sensitive life stages including breeding and aestivation periods. As determined by a qualified biologist/Natural Resource staff, pre-activity surveys will be conducted where activities may pose a higher risk due to timing, location, or intensity of activity. If any WSF are found, activities will be adjusted or postponed until the qualified staff relocates the individual(s) out of harm's way or until they determine the project can proceed with minimal risk to the safety of the WSF. They may also employ protective fencing, rescheduling work times or locations, or other AMM measures where appropriate.

AMM 5 Non-emergency activities with the potential to crush dispersing WSF will be suspended during heavy precipitation events (i.e., at least 0.5 inches of precipitation in a 24-hour period) near potentially occupied WSF habitat. Activities will be postponed up to 48 hours post precipitation, at the discretion of the qualified biologist/Natural Resource staff.

AMM 6 Per Public Resources Code and CDPR Policy, CDPR will prohibit the release of mosquitofish or any other non-native aquatic organism into aquatic habitat.

AMM 7 Once per year, a qualified biologist/Natural Resource staff will conduct a training session for all CDPR and golf course maintenance personnel, concessions, and lessees. The training, at a minimum, will cover WSF life history and work constraints.

AMM 8 As part of annual reporting, WSF sightings will be submitted to CNDDB.

AMM 9 CDPR will continue to implement management measures and modify AMMs in accordance with ongoing adaptive management and based on recommendations found in annual monitoring reports.

Park Visitor Activities: Motorized Recreation (CA-1)

Potential Effects: Dispersing individuals struck by vehicles; Dormant individuals disturbed by OHV noise.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Park Visitor Activities: Camping (CA-2)

Potential Effects: Dispersing individuals exposed to increased predation due to trash.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

AMM 10 Trash dumpsters will continue to be provided throughout the HCP area. Trash receptacles are designed to prevent access by potential predators, including covered dumpsters that open from the side and trash bins with lids. CDPR will continue to implement options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites.

AMM 11 All visitors will continue to be informed they are to deposit their trash in dumpsters/ receptacles provided. All campers are offered plastic garbage bags. All staff will continue to carry trash bags in each vehicle and make them available to visitors for removing trash and litter from visitor use areas.

AMM 12 As staff levels and funding allow, CDPR will continue to manually remove litter and garbage from aquatic areas that could support WSF.

AMM 13 If an aestivating WSF is discovered in a location where it may be accessible to visitors, if feasible, a qualified biologist/Natural Resource staff will monitor the area to evaluate whether WSF might need protection such as fencing, signage and/or other appropriate methods.

Park Visitor Activities: Pedestrian Activities (CA-3)

Potential Effects: Egg cluster damaged or destroyed.

Avoidance and Minimization Measures: All AMMs apply, as appropriate.

Table 5-6. Avoidance and Minimization Measures for WSF	
AMM 14	If WSF egg clusters are observed in or near locations where they may be accessible to visitors, CDPR will install fencing and/or signage to keep visitors away from the area.
Park Visitor Activities: Dog Walking (CA-6)	
Potential Effects: Individuals disturbed; Individuals exposed to increased turbidity; Water quality decreased by depositing waste and/or trampling vegetation; Individuals exposed to increased predation; Foraging activities and reproductive success reduced.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate	
AMM 15	Dogs will continue to be required to be on a leash no longer than 6 feet at all times and under complete control of the owner within the HCP area.
AMM 16	Waste bags will continue to be provided in the HCP area to encourage pet owners to pick up dog waste.
AMM 17	As funding and staff time are available, CDPR will continue to manually remove litter and garbage from WSF habitat.
Park Visitor Activities: Equestrian Recreation (CA-7)	
Potential Effects: Egg cluster damaged or destroyed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Visitor Activities: Holidays (CA-10)	
Potential Effects: Effects for all covered activities on holidays are not expected to be different from those on non-holidays	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Visitor Activities: Special Events (CA-11)	
Potential Effects: Effects based on the specific event activity(ies) permitted, but similar to motorized recreation (CA-1), camping (CA-2), and pedestrian activities (CA-3).	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 18	All permits authorizing special events will include AMMs to reduce disturbance to WSF. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
Natural Resources Management: Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (12a)	
Potential Effects: Individuals crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 19	Work that involves soil movement would not be conducted during or immediately after heavy precipitation events (i.e., at least 0.5 inches of precipitation in a 24-hour period).
Natural Resources Management: Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)	
Potential Effects: Individuals crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Natural Resources Management: Tidewater Goby and Salmonid Surveys (CA-13)	
Potential Effects: Individuals disturbed/injured/captured; Egg clusters damaged.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 20	A visual survey for WSF or egg clusters will be conducted prior to sampling in areas where WSF may be present. If WSF are present, surveys will be postponed until a qualified biologist/Natural Resource staff determines they can safely proceed, including by implementing appropriate AMMs. If egg clusters are present, sampling will be postponed until the eggs have hatched or the survey will be conducted to avoid all egg clusters.
AMM 21	Prior to activities that may involve handling WSF, the surveyor will ensure that hands are free of sunscreens, lotion, nicotine, and insect repellent.
AMM 22	If WSF are incidentally captured during surveys, they will be checked for injury and released immediately at the capture site. This information will be included in the annual report to USFWS.
AMM 23	If WSF are injured or killed during surveys, it will be reported to the USFWS as part of the annual report or through the USFWS Recovery Permit.
AMM 24	To reduce predation from invasive species, qualified biologist/Natural Resource staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrogs, largemouth bass, red-eared sliders, crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on WSF.
AMM 25	CDPR will continue to monitor populations of invasive predators during fisheries, herpetological, and WSF surveys. As needed, CDPR will control invasive predators to offset impacts as outlined in the WSF Goals and Objectives (section 5.2.6).

Table 5-6. Avoidance and Minimization Measures for WSF
AMM 26 CDPR will continue to prohibit the release of mosquitofish into any known or potential WSF breeding habitat.
Potential Effects: Individuals exposed to increased risk of disease.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 27 Surveyors will continue to follow the USFWS Recommended Equipment Decontamination Procedures, which provides guidance for disinfecting equipment and clothing after entering a pond and before entering an aquatic resource.
Natural Resources Management: Herpetological Monitoring and Management (CA-14)
Potential Effects: Individuals killed/disturbed/injured/captured; Egg clusters damaged; Individuals exposed to increased risk of spread of disease.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 28 If WSF is listed, CDPR will amend the USFWS Recovery Permit to include surveys and management activities for WSF. AMM 29 A USFWS-approved biologist will follow all USFWS WSF survey guidance upon issuance. Surveyors will be trained in the identification and avoidance measures of WSF.
Natural Resources Management: Listed Plant Management Activities (CA-15)
Potential Effects: Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 30 Best Management Practices will be employed where needed to reduce turbidity from work in aquatic habitat. AMM 31 Any time a work activity needs to be conducted on the bed, banks, or channel of an aquatic habitat with the potential to support WSF, appropriate steps will be taken to minimize turbidity from activities. If possible, activities will be conducted from outside the wetted area or from stream banks or other upland areas. If activity is necessary in wetted areas, work will be limited to the minimum necessary to achieve desired outcome and care will be taken to reduce turbidity, especially during critical periods like when egg clusters are present or tadpoles are present in the water.
Potential Effects: Individuals and/or egg clusters disturbed, harmed, or destroyed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 32 If a WSF is found within 100 feet of plant management activities in WSF habitat, activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or determines the activities can continue with minimal risk to the safety of individual WSF. They may also employ exclusion fencing, biological monitoring and/or other measures where appropriate.
Natural Resources Management: Habitat Restoration Program (CA-16)
Potential Effects: Individuals exposed to increased turbidity; Individuals and/or egg clusters disturbed/harmed/destroyed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Natural Resources Management: Invasive Plant and Animal Control (CA-17)
Potential Effects: Individuals exposed to increased turbidity; Individuals and/or egg clusters disturbed/injured/captured/destroyed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 33 As funding and staff resources allow, CDPR will eradicate or reduce the cover, biomass, and distribution of non-native invasive plants to enhance WSF habitat. Routine vegetation management will continue to occur at Oso Flaco area, Oceano Lagoon and Lagoon Trail, Meadow Creek, and Pismo Lake spillway. Other areas where vegetation management may occur include Arroyo Grande Creek and Estuary and dune lakes and wetlands. Vegetation management also includes removal of emergent vegetation and debris, as necessary to improve potential CRLF habitat, which will also improve WSF habitat.
Natural Resources Management: Water Quality Monitoring Projects (CA-19)
Potential Effects: Individuals exposed to increased turbidity; Individuals and/or egg clusters disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Campground Maintenance (CA-20)
Potential Effect: Dispersing individuals crushed/injured.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 34 Mowing of campgrounds and golf course will be limited to the maximum area necessary to provide for safe public access and limited to public use areas. Care will be taken to avoid mowing wetland areas, wetland vegetation, and in proximity to riparian vegetation to avoid aestivating or dispersing WSF. Mowing activities will be adjusted as new information becomes available on the dispersal and habits of WSF in the covered lands.

Table 5-6. Avoidance and Minimization Measures for WSF	
AMM 35	If a WSF is observed during maintenance activities, the activities will be postponed until a qualified biologist/Natural Resource staff relocates the individual or determines the activities can continue with minimal risk to the safety of individual WSF. They may also employ exclusion fencing, biological monitoring, and/or other measures where appropriate.
Park Maintenance: General Facilities Maintenance (CA-21)	
Potential Effect: Individuals crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Routine Riparian Maintenance (CA-26)	
Potential Effect: Individuals and egg clusters crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 36	Culvert maintenance will be conducted during periods when all WSF life stages are unlikely to occur in the project area (e.g., May 1 – Oct. 31 or until the first measurable fall rain of 1" or greater), to the extent feasible.
AMM 37	If work must be conducted during the WSF breeding season, a qualified biologist/Natural Resource staff will determine whether to conduct focused surveys of the work sites. Such surveys would be conducted no more than 2 days before the onset of activities associated with projects within suitable breeding habitat for WSF (e.g., culvert maintenance). If WSF adults, tadpoles, or eggs are found, work will not commence until AMMs are in place. AMMS can include such measures as relocation, exclusion fencing with additional monitoring to prevent take along fenceline, and/or biological monitoring during maintenance activities.
AMM 38	WSF life-stages found in the work area will be relocated upon determination by the qualified biologist/Natural Resource staff that an appropriate relocation site exists, and relocation is the preferred avoidance method. They will be allowed sufficient time to move WSF from the work site before activities begin. Only those qualified will participate in activities associated with capturing, handling, and monitoring WSF. They will follow safe-handling practices as outlined in the Declining Amphibians Population Task Force Code of Practice.
AMM 39	Heavy equipment will continue to be operated from the roadside or upper banks and will not be placed in the water body during culvert maintenance. Backhoe work will continue to be restricted to the roadside or upper bank and only the bucket may be placed in the water body.
AMM 40	CDPR staff will continue to limit the amount of disturbance to vegetation, banks, and streambed. Work and entrance into the work area will continue to be restricted to established areas.
AMM 41	All refueling, maintenance, and staging of equipment and vehicles will continue to occur at least 60 feet from riparian habitat and water bodies in a location where a spill will not drain directly toward aquatic habitat.
AMM 42	All vehicles and equipment will continue to be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Prior to the start of maintenance activities, all equipment will continue to be inspected for leaks.
AMM 43	A spill plan will continue to be in place for prompt and effective response to an accidental spill. The spill plan will continue to include, at a minimum, immediately notifying the biologist of any hazardous spills and immediately cleaning up spills. All Park staff will continue to be informed of the importance of preventing spills and appropriate measures to take when a spill happens.
AMM 44	All equipment and vehicles under-carriages will continue to be inspected periodically. Equipment that has been parked near potentially occupied WSF habitat will be re-inspected prior to moving.
Potential Effect: Individuals exposed to increased predation.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Potential Effect: Individuals exposed to increased turbidity; Individuals exposed to increased risk of spread of disease; Temporary disturbance of approximately 0.3 acre of wetlands.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)	
Potential Effect: Individuals crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Heavy Equipment Response (CA-29)	
Potential Effect: Individuals crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Minor Grading (CA-30)	
Potential Effect: Individuals crushed/injured/disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Maintenance: Boardwalk and Other Pedestrian Access Maintenance (CA-31)	

Table 5-6. Avoidance and Minimization Measures for WSF
Potential Effect: Individuals disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 45 Crews will continue to use hand tools to trim all vegetation.
Visitor Services: Emergency Response (CA-33)
Potential Effects: Individuals struck by vehicles; Breeding and/or dispersal habitat damaged; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and appropriate.
Visitor Services: Access by Non-CDPR Vehicles (CA-34)
Potential Effects: Individuals struck by vehicles; Breeding and/or dispersal habitat damaged; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and appropriate.
Visitor Services: Pismo State Beach Golf Course Operations (CA-37)
Potential Effects: Dispersing individuals injured/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
Potential Effects: Individuals struck by vehicles; Individuals disturbed; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 46 Even though Pismo/Carpenter and Oso Flaco Creeks are closed to the public, CDPR and contractors must still drive across these creeks. CDPR staff will continue to periodically review conditions and identify any issues that may result from vehicle crossings in areas where there is ponded water. If, in the opinion of a qualified biologist/Natural Resource staff, a vehicle crossing would present a threat to any life stages of WSF, staff will close this access until conditions have changed. AMM 47 When tidal action or stream flow increase ponded areas within Arroyo Grande Creek and Estuary, CDPR will regularly inspect and modify fences to prevent all vehicle activity in ponded water.
Other HCP Covered Activities: Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)
Potential Effects: Individuals disturbed; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Limited Trail Riding Area (CA-42)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 48 CDPR will conduct pre-activity surveys prior to commencing any activities disturbing suitable WSF upland habitat. AMM 49 Should an aestivating WSF be found during trail construction, all work will stop until a qualified biologist/Natural Resource staff determines work may proceed, including with implementation of AMMs. AMMs may include such measures as relocation, exclusion fencing, transfer to a rehabilitation facility, relocation to a suitable site outside the work area, and/or biological monitoring during activities.
Other HCP Covered Activities: Dust Control Activities (CA-44)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Cultural Resources Management (CA-45)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: CDPR Management of Agricultural Lands (CA-46)
Potential Effects: Aestivating and/or dispersing individuals crushed/injured/disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Oso Flaco Lake Boardwalk Replacement (CA-48)
Potential Effects: Same as riparian maintenance activities; Potential loss of aquatic habitat; Individuals exposed to increased turbidity; Water quality decreased.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 50 Before any project activities occur, a qualified biologist/Natural Resource staff will conduct a training session for all construction personnel. At a minimum, the training will include a description of the WSF and its habitat, the importance of the WSF and its habitat, the general measures that are being implemented to conserve the WSF as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session, provided a qualified person is on hand to answer any questions.

Table 5-6. Avoidance and Minimization Measures for WSF	
AMM 51	The construction footprint will be limited as much as possible, with all construction areas including access and staging areas clearly demarcated.
AMM 52	As feasible, boardwalk replacement will be constructed during a period when egg clusters are unlikely to occur in the project area. A qualified biologist/Natural Resource staff will survey the work site ≤2 days before the onset of activities. If WSF adults, tadpoles, or eggs are found, work will not commence until avoidance measures are in place.
AMM 53	Any WSF life-stages found in the project work area may be relocated upon determination by the qualified biologist/Natural Resource staff that an appropriate relocation site exists and relocation is the preferred avoidance method. The biologist will be allowed sufficient time to move WSF from the work site before work activities begin. Only qualified biologists/Natural Resource staff will participate in activities associated with the capture, handling, and monitoring of WSF.
AMM 54	A qualified biologist/Natural Resource staff will be present at the work site, as needed, or until the removal or protection of all WSF, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor on-site compliance with all minimization measures. The qualified biologist/Natural Resource staff will ensure that this individual receives training. The training, at a minimum, will cover identification and life history of WSF and work constraints. The monitor and the qualified staff will have the authority to halt any action that might result in impacts that exceed the levels anticipated by the USFWS.
AMM 55	As practical, pile driving will always use a soft start procedure. The soft start would include an initial set of three strikes from the impact hammer at reduced energy, followed by a 1-minute waiting period. This process will be repeated a total of three times prior to initiation of pile driving. Soft start is required for any impact driving, including at the beginning of the day and at any time following a cessation of impact pile driving of 30 minutes or longer.
AMM 56	Whenever feasible, a vibratory hammer will be used.
AMM 57	CDPR will comply with all permit requirements, including best management practices to minimize sediment impacts.
Other HCP Covered Activities: Special Projects (CA-49)	
Potential Effects: Permanent and/or temporary loss of upland habitat; Individuals crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Other HCP Covered Activities: Use of Pesticides (CA-51)	
Potential Effects: Disturbance of habitat; Exposure from contact with contaminated prey or vegetation; Exposure from contact with residues; inhalation of vapors.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 58	Any application of herbicide or pesticide in aquatic habitat will be consistent with the Aquatic Pesticide Application Plan (APAP) and will be designed to achieve control of pests or exotic species while protecting water quality and aquatic organisms.
AMM 59	When pesticide application must occur near WSF breeding habitat, a qualified biologist/Natural Resource staff will conduct a survey for WSF as practical prior to the application and will instruct the work crew on their identification and biology. If WSF is observed, all work will cease immediately until the CDPR biologist arrives and assesses the situation to determine if the work can proceed.
AMM 60	Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side.
AMM 61	Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or NWS forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application.
AMM 62	CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats.
AMM 63	CDPR will continue to ensure that qualified personnel are present at all phases of the work to ensure that pesticide application activities do not result in impacts to covered species.
AMM 64	If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements.

Table 5-6. Avoidance and Minimization Measures for WSF	
AMM 65	Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information.
AMM 66	CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made.
AMM 67	All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.1.6 Tidewater Goby

The majority of AMMs for tidewater goby are part of the ongoing natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge), and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities for tidewater gobies. The table first lists general AMMs applicable to multiple covered activities and then lists AMMs specific to certain covered activities. Covered activities that do not have effects on tidewater gobies are not listed in the table.

Table 5-7. Avoidance and Minimization Measures for Tidewater Goby	
General AMMs	
AMM 1	CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites and social media. Content may include life history information, measures being taken to protect all HCP covered species found at the parks, and the importance of not touching or disturbing covered species. Information will be updated as needed and visitors can visit campground kiosks or interpretive events for additional information such as what they can do to protect the covered species. Covered species information will also be included as part of ongoing interpretative programs.
AMM 2	Once per year, a qualified biologist/Natural Resource staff will conduct a training session for all CDPR personnel, concessions, and lessees. The training, at a minimum, will cover tidewater goby life history and work constraints. The training session will be repeated for any new personnel at the work site or where conditions at a particular project site warrants additional training.
AMM 3	Per Public Resources Code and CDPR Policy, CDPR will prohibit the release of mosquitofish or any other non-native aquatic organism into aquatic habitat.
AMM 4	CDPR will continue to implement management measures and modify AMMs in accordance with ongoing adaptive management and based on recommendations found in annual monitoring reports.
Park Visitor Activities: Motorized Recreation **(CA-1)**	
Potential Effects: Individuals disturbed/crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 5	The Arroyo Grande Creek and Estuary and areas west of the estuary where waters have pooled will continue to be posted 'closed' to motor vehicle access.
AMM 6	Pursuant to Superintendent's Order, visitors will continue to be prohibited from crossing Arroyo Grande Creek in any other manner than by crossing the creek as close to the ocean waterline as possible and parallel to the ocean waterline. Driving upstream or downstream in the creek channel or in any other manner in the creek channel will continue to be prohibited. Vehicles will continue to be prohibited from crossing the creek when the water depth exceeds 12 inches.
AMM 7	Crossing of Arroyo Grande Creek by motor vehicles will continue to be regulated by park Visitor Services and Ranger staff daily during periods of high stream flow and periods of high stream flow in combination with high tides. Creek crossings may be restricted or closed at any time, depending on these conditions. Rangers will continue to take enforcement action, where appropriate.
AMM 8	Specific guidelines for closure of Arroyo Grande Creek to vehicular crossings by the public will continue to be implemented.

Table 5-7. Avoidance and Minimization Measures for Tidewater Goby	
AMM 9	As necessary, after major flows or other natural events that change the physical habitat characteristics of the lagoons, CDPR staff will continue to modify the alignment of fencing closing the area to motor vehicles to prevent vehicle access into pooled areas that could support tidewater goby.
Park Visitor Activities: Pedestrian Activities (CA-3)	
Potential Effects: Individuals disturbed; Burrows collapsed; Individuals exposed to increased turbidity; Individuals exposed to increased predation; Foraging activities and reproductive success reduced.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 10	As practical, the ponded areas of Arroyo Grande Creek and Estuary, Pismo Creek, or Carpenter Creek estuaries will be closed to the public.
AMM 11	CDPR will continue to monitor areas where pedestrians enter potential tidewater goby habitat. If tidewater gobies are observed in or near such locations, CDPR will post signs closing the area or take other action determined by the qualified biologist/Natural Resource staff as necessary to avoid harm to them or their habitat.
AMM 12	CDPR will continue to pursue installing the seasonal floating bridge (CA-41) across the Pismo Creek Lagoon if it is found to be beneficial and feasible.
Park Visitor Activities: Dog Walking (CA-6)	
Potential Effects: Individuals disturbed; Individuals exposed to increased turbidity; Water quality decreased by depositing waste and/or trampling vegetation; Individuals exposed to increased predation; Foraging activities and reproductive success reduced.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 13	Dogs will continue to be required to be on a leash no longer than 6 feet at all times and under complete control of the owner within the HCP area.
AMM 14	Waste bags will continue to be provided in the HCP area to encourage pet owners to pick up dog waste.
AMM 15	As funding and staff time are available, CDPR will continue to manually remove litter and garbage from tidewater goby habitat.
Park Visitor Activities: Equestrian Recreation (CA-7)	
Potential Effects: Individuals disturbed/injured; Burrows collapsed; Individuals exposed to increased turbidity; Water quality decreased due to depositing waste and/or trampling vegetation; Foraging activities and reproductive success reduced.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Park Visitor Activities: Holidays (CA-10)	
Potential Effects: Effects for all covered activities on holidays are not expected to be different from those on non-holidays.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 16	During anticipated high visitor use periods as determined by historic visitor-attendance records (e.g., Memorial Day Weekend, July 4 Weekend, Labor Day Weekend) Natural Resource and Visitor Service staff will continue to provide frequent observations of the vehicle/pedestrian crossing areas at Arroyo Grande Creek, Carpenter Creek, and Pismo Creek.
Park Visitor Activities: Special Events (CA-11)	
Potential Effects: Effects based on the specific event activity(ies) permitted.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 17	All permits authorizing special events will continue to include AMMs to reduce disturbance to tidewater goby. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
Natural Resources Management: Tidewater Goby and Salmonid Surveys (CA-13)	
Potential Effects: Individuals exposed to increased turbidity; Individuals and egg burrows disturbed; Individuals captured/injured/killed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 18	A USFWS- and/or NOAA Fisheries-approved biologist will continue to conduct the surveys.
AMM 19	Surveys will continue to be conducted in accordance with the survey guidelines in Appendix F of the tidewater goby recovery plan for the species (USFWS 2005a) or in accordance with any subsequent revisions USFWS or NOAA may develop during the permit term.
AMM 20	The USFWS- and/or NOAA Fisheries-approved biologist will continue to use minnow traps, dipnets, seine nets, and other nets that are of appropriate mesh size.
AMM 21	Disturbance and damage to burrows, eggs, and young will continue to be minimized through the use of the smallest seines and lightest seine weights practicable.
AMM 22	Any tidewater goby exhibiting signs of stress will continue to be immediately released at the capture location.

Table 5-7. Avoidance and Minimization Measures for Tidewater Goby	
AMM 23	Dipnetting and seining will continue to be limited to no more than 40 percent of the project area, excluding stream channels, unless the surveys are to be conducted during the breeding season (generally April through mid-June). Seining during the breeding season will continue to be limited to affect no more than 20 percent of the habitat.
AMM 24	Prior to activities that may involve handling tidewater gobies, the surveyor(s) will continue to ensure that hands are free of sunscreens, lotion, nicotine, and insect repellent.
AMM 25	No electrofishing will continue to occur in tidewater goby habitat. If electrofishing is authorized for salmonid surveys, and tidewater gobies are subsequently found in an area they were previously not known to occur, electrofishing will continue to cease immediately.
AMM 26	To prevent the introduction of new invasive animal and plant species, all CDPR staff and/or contractors will continue to be required to ensure that work boots, vehicles, and equipment that enter the water have been cleaned.
AMM 27	CDPR will continue to conduct fisheries surveys to follow, document, and report on the likely future recolonization of restored wetted areas by several aquatic species, including tidewater goby. This information will continue to be provided to resource agencies and used to contribute to the recovery of tidewater goby.
AMM 28	To reduce predation from invasive species, qualified biologists/Natural Resource staff and consultants working under CDPR's 10(a)(1)(A) Recovery Permit (or approved by USFWS) will euthanize invasive species (e.g., bullfrog, mosquitofish, largemouth bass, and crayfish) incidentally encountered during fisheries and herpetological surveys, which will also reduce predation on tidewater goby.
AMM 29	CDPR will continue to monitor populations of invasive predators during fisheries and herpetological surveys. As needed, CDPR will control invasive predators to offset impacts as outlined in the tidewater goby Goals and Objectives (Section 5.2.7).
Potential Effects: Individuals exposed to increased risk of disease	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 30	Surveyors will continue to follow the USFWS Recommended Equipment Decontamination Procedures, which provides guidance for disinfecting equipment and clothing after entering a pond and before entering an aquatic resource.
Natural Resources Management: Herpetological Monitoring and Management (CA-14)	
Potential Effects: Egg burrows disturbed; Individuals captured/injured/killed; Individuals exposed to increased turbidity.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 31	When possible and appropriate, eyeshine surveys for CRLF will continue to be conducted to minimize disturbance to tidewater gobies and their habitat.
AMM 32	Dipnet surveys, if conducted in the HCP area, will be conducted in a manner that minimizes disturbance to aquatic habitat that could overlap with tidewater goby habitat.
Natural Resources Management: Listed Plant Management Activities (CA-15)	
Potential Effects: Individuals exposed to increased turbidity.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 33	Best Management Practices will be employed where needed to reduce turbidity from work in aquatic habitat.
AMM 34	Any time a work activity will need to be conducted on the bed, banks, or channel of aquatic habitat with the potential to support tidewater goby, appropriate steps will continue to be taken to minimize turbidity from activities. If possible, activities will continue to be conducted from outside the wetted area or from stream banks or other upland areas. If activity is necessary in wetted areas, work will continue to be limited to the maximum necessary to achieve desired outcome and care will be taken to reduce turbidity.
Natural Resources Management: Invasive Plant and Animal Control (CA-17)	
Potential Effects: Individuals exposed to increased turbidity; Individuals disturbed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 35	To prevent erosion and sedimentation, vegetation removal and bank disturbance will continue to be kept to the minimum amount necessary to complete the task.
AMM 36	Activities within tidewater goby habitat will continue to be avoided, if possible, or kept to a minimum. If activities require that personnel work in the water, only one person will enter the water while the remaining personnel conduct work from land.
AMM 37	Precautions will continue to be taken to avoid damage to non-target vegetation.
AMM 38	As funding and staff resources allow, CDPR will continue to eradicate or reduce the cover, biomass, and distribution of non-native invasive plants to enhance tidewater goby habitat. Routine vegetation management will continue to occur at Oso Flaco area, Meadow Creek, and Pismo Lake spillway. Other areas where vegetation management

Table 5-7. Avoidance and Minimization Measures for Tidewater Goby	
	may occur include Arroyo Grande Creek and Estuary. Vegetation management also includes removal of emergent vegetation and debris, as necessary to improve potential tidewater goby habitat.
Natural Resources Management: Water Quality Monitoring Projects (CA-19)	
Potential Effects: Individuals exposed to increased turbidity; Individuals disturbed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 39	CDPR will continue to work with public agencies, landowners, and stakeholders to secure a sustained water inflow into the estuary, focused on sustainable groundwater use and maintenance of instream flows in the lower mile of Arroyo Grande Creek.
AMM 40	CDPR will work with the County on their operations and maintenance of the Sand Canyon Flapgate to minimize impacts to goby from sediment, invasive aquatic species, and other similar threats.
Park Maintenance: Routine Riparian Maintenance (CA-26)	
Potential Effect: Individuals exposed to increased turbidity; Individuals/egg burrows disturbed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 41	If activities are proposed near occupied tidewater goby habitat, as feasible, CDPR staff will continue to limit project activities in the channel and along stream banks to the drier period of the year (generally May 1 to December 1) or when the stream is not actively flowing, or at its lowest flow, and when there is no measurable rain forecasted within 48 hours of work activities.
AMM 42	A USFWS-approved biologist will conduct focused surveys of the work sites no more than 2 weeks before the onset of activities associated with projects within suitable habitat for tidewater goby (e.g., culvert maintenance). If tidewater gobies are found, work will not commence until AMMs are in place.
AMM 43	Activities and entrance into the work area will continue to be restricted to established areas.
AMM 44	A USFWS-approved biologist will continue to conduct a pre-activity survey for tidewater goby in occupied tidewater goby habitat prior to commencing activities. If tidewater goby is observed in the work area or water is present in the work area and it cannot be determined if tidewater gobies are present, the qualified biologist/Natural Resource staff will continue to determine the appropriate measures taken to protect the tidewater goby population. These measures could include, but are not limited to, establishing fencing or otherwise demarcating a barrier between the work site and the tidewater goby population and/or relocation by a USFWS-approved biologist.
AMM 45	Heavy equipment will continue to be operated from the roadside or upper banks and will not be placed in the water body during culvert maintenance. Backhoe work will continue to be restricted to the roadside or upper bank and only the bucket may be placed in the water body.
AMM 46	CDPR staff will continue to limit the amount of disturbance to vegetation, banks, and streambed. Work and entrance into the work area will continue to be restricted to established areas.
AMM 47	All refueling, maintenance, and staging of equipment and vehicles will continue to occur at least 60 feet from riparian habitat and water bodies in a location where a spill will not drain directly toward aquatic habitat.
AMM 48	A spill plan will continue to be in place for prompt and effective response to an accidental spill. The spill plan will continue to include, at a minimum, immediately notifying the biologist of any hazardous spills and immediately cleaning up spills. All Park staff will continue to be informed of the importance of preventing spills and appropriate measures to take when a spill happens.
AMM 49	All equipment and vehicles under-carriages will continue to be inspected periodically. Equipment that has been parked near potentially occupied tidewater goby habitat will be re-inspected prior to moving.
Park Maintenance: Heavy Equipment Response (CA-29)	
Potential Effect: Individuals exposed to increased turbidity; Individuals disturbed/crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 50	Heavy equipment will operate from existing roads or top of bank whenever possible, avoiding ponded areas.
Park Maintenance: Minor Grading (less than 50 cubic yards) (CA-30)	
Potential Effect: Individuals exposed to increased turbidity; Individuals disturbed/crushed/injured.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 51	Heavy equipment will continue to operate outside of ponded water during any minor grading activities. Heavy equipment will operate from existing roads or top of bank whenever possible.
Visitor Services: Ranger, Lifeguard, and Park Aide Patrols (CA-32)	
Potential Effects: Individuals disturbed/crushed/injured; Water quality decreased.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
Visitor Services: Emergency Response (CA-33)	

Table 5-7. Avoidance and Minimization Measures for Tidewater Goby
Potential Effects: Habitat damaged; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and applicable.
Visitor Services: Access by Non-CDPR Vehicles (CA-34)
Potential Effects: Habitat damaged; Individuals exposed to increased turbidity.
Avoidance and Minimization Measures: All AMMs apply, as feasible and applicable.
Other HCP Covered Activities: Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)
Potential Effects: Individuals disturbed/crushed/injured; Water quality decreased.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 52 Even though Pismo/Carpenter and Oso Flaco Creeks are closed to the public, CDPR and contractors must still drive across these creeks. CDPR staff will continue to periodically review conditions and identify any issues that may result from vehicle crossings in areas where there is ponded water. If, in the opinion of a qualified biologist/Natural Resource staff, a vehicle crossing would present a threat to tidewater goby, staff will close this access until conditions have changed. AMM 53 When tidal action or stream flow increase ponded areas within Arroyo Grande Creek and Estuary, CDPR will regularly inspect and modify fences to prevent all vehicle activity in ponded water.
Other HCP Covered Activities: Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)
Potential Effects: Individuals disturbed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 54 To allow movement of all fish species as well as an exchange of fresh and saltwater, the interlocking pieces of the bridge will be constructed to create wide openings under the bridge. Openings will be designed as wide as possible while maintaining structural integrity to ensure water flow even when the bridge sits on the bed of the estuary during low flows. AMM 55 If water levels are so low that the bridge is not allowing the free movement of fish in the estuary, the bridge will be removed until there is sufficient water to allow the bridge to float.
Other HCP Covered Activities: Use of Pesticides (CA-51)
Potential Effects: Habitat disturbance; Exposure from contact with contaminated prey or vegetation; Exposure from contact with residues.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 56 Any application of herbicide or pesticide in aquatic habitat will be consistent with the Aquatic Pesticide Application Plan (APAP) and will be designed to achieve control of pests or exotic species while protecting water quality and aquatic organisms. AMM 57 When pesticide application must occur near tidewater goby habitat, a qualified biologist/Natural Resource staff will conduct a survey for tidewater goby as practical prior to the application and will instruct the work crew on their identification and biology. If tidewater goby is observed, all work will cease immediately until the qualified staff arrives and assesses the situation to determine if the work can proceed. AMM 58 Herbicides used in tidewater goby habitat will be limited to those designed for aquatic applications and will continue to be applied directly to target species on a low or receding tide when water is not present, so residual amounts that may reach the water on the returning tide are small and rapidly diluted. AMM 59 Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. AMM 60 Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or NWS forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application. AMM 61 CDPR will continue to ensure that all workers are trained in the safe and effective use of herbicides in sensitive habitats. AMM 62 CDPR will continue to ensure that qualified personnel are present at all phases of the work to ensure that herbicide application activities do not result in impacts to covered species. AMM 63 If pesticides are spilled, they will be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and will be familiar with the use of absorbent materials. Spills will be cleaned up according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements.

Table 5-7. Avoidance and Minimization Measures for Tidewater Goby	
AMM 64	Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information.
AMM 65	CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made.
AMM 66	All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.1.7 Listed Plants

The majority of AMMs for listed plants are part of ongoing the natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., limited trail riding area) and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities on La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo mesa lupine, marsh sandwort, and Gambel's watercress. Covered actions that do not have effects on these plants are not listed in the table. Potential effects listed are relevant to all listed plant species unless otherwise specified.

Table 5-8. Avoidance and Minimization Measures for Plants	
Park Visitor Activities: Pedestrian Activities **(CA-3)**	
Potential Effects: Beach spectaclepod, surf thistle, and La Graciosa thistle trampled.	
Avoidance and Minimization Measures:	
AMM 1	CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites including life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well.
AMM 2	In areas where the public is allowed in occupied habitat, plants will continue to be fenced to deter pedestrians from entering the sensitive areas. If a population is found where there is heavy public activity like the Dune Preserve or Grand Dunes areas, fencing and signage will continue to be installed.
AMM 3	Informal trails in and adjacent to listed plant species habitats will continue to be closed and restored to original conditions.
AMM 4	Habitat restoration will continue to be conducted to benefit beach spectaclepod, surf thistle, and La Graciosa thistle.
AMM 5	A program of selective propagation of specific listed plant species to augment existing populations and adjacent unoccupied habitats will be developed if monitoring shows CDPR or public activities negatively impacting individuals or populations.
AMM 6	CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports.
Natural Resources Management: Listed Plant Management Activities **(CA-15)**	
Potential Effects: Plants trampled/crushed.	
Avoidance and Minimization Measures:	
AMM 7	Staff with specific training in the identification of listed plant species will continue to survey areas with known populations. Surveys will continue to be conducted annually or as necessary based on the level of management needed.
AMM 8	Prior to the onset of activities that could affect listed plant habitat, a qualified biologist/Natural Resource staff will continue to conduct a training session for all personnel. At a minimum, the training will continue to include a description of relevant plants and their habitat and AMMs that should be implemented. The training session will continue to be repeated for any new personnel.
AMM 9	Staff will continue to be urged to limit time in occupied habitat to reduce the potential for trampling listed plants. CDPR staff will continue to limit the amount of disturbance to vegetation to the minimum necessary to complete the project. Work and entrance into the work area will continue to be restricted to established areas.

Table 5-8. Avoidance and Minimization Measures for Plants	
AMM 10	Water quality monitoring and improvement projects will continue to be conducted to benefit marsh sandwort and Gambel's watercress.
AMM 11	Only grass specific herbicides will be used in areas where listed broadleaf listed species are present and may be exposed to the herbicide
AMM 12	Only post-emergent herbicides will be used within occupied habitat and/or mapped historic locations for listed species to prevent negative impacts to seed bank germination.
Potential Effects: Plants burned during prescribed fire activities for listed species management.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 13	Prior to initiating a prescribed burn, populations of listed plant species will continue to be clearly marked on the ground, and non-native vegetation will be pulled by hand to establish a fire line of mineral soil around all known populations of listed plant species. The fire line will continue to be the minimum necessary to protect known listed plant populations.
AMM 14	Fire personnel, pesticide applicators, and restoration crews will continue to receive training prior to activities. The training will continue to include information regarding identification of listed plant species, the life history of listed species, instructions to avoid damage to listed species, and the need to remain out of the restricted areas and within the work areas and access routes.
AMM 15	Heavy equipment, including fire engines and pumper trucks, will continue to be located outside of sensitive habitat. Locations for the placement and staging of heavy equipment are always clearly marked on a map, as well as on the ground.
AMM 16	A trained botanist will continue to be present during fire activities. The monitor will have the authority and responsibility to stop work if unanticipated damage to listed plant species occurs.
Natural Resources Management: Habitat Restoration Program (CA-16)	
Potential Effects: Plants trampled/crushed.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 17	Prior to conducting project activities, the project area will continue to be surveyed by a trained botanist for listed plant species. Every effort will be made to locate populations of listed plant species, identify their location on a map, and clearly mark their locations on the ground before work crews and equipment are allowed in the project area.
AMM 18	If listed species are found within 100 feet of surface-disturbing activities, they will continue to be avoided by a marked and/or fenced buffer of 25 feet within the project area or other distance as identified by the qualified botanist. Fencing and/or flagging will be removed at the completion of activities.
AMM 19	If plants are found during pre-activity surveys and cannot be avoided, plants will continue to be salvaged and relocated.
Natural Resources Management: Invasive Plant and Animal Control (CA-17)	
Potential Effects: Plants trampled/crushed; Plants burned during prescribed fire activities during non-listed species management; Plants sprayed during herbicide application.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 20	Only workers with specific training in the identification of listed plant species will continue to work in areas with known populations.
AMM 21	Non-native vegetation will continue to be cleared by hand and/or with herbicide, using experienced herbicide applicators, within and near listed plant populations. Herbicide application will typically be used sparingly and will be done under the close supervision of an experienced botanist.
AMM 22	Attention will be given to access corridors, treatment sites that include on-the-ground activities, and previously known populations of listed plants.
AMM 23	Trained resource personnel will continue to be present at all phases of the work to ensure that activities will not result in damage to listed species.
AMM 24	Records will continue to be kept of all invasive plant and animal control management activities. These records will continue to include an assessment of the target invasive plant population, treatment employed, location of area treated, supervisor of treatment, date of treatment, amount of pesticides used, and weather conditions during treatment.
Park Maintenance: Routine Riparian Maintenance (CA-26)	
Potential Effects: La Graciosa thistle, Gambel's watercress, and marsh sandwort damaged.	
Avoidance and Minimization Measures: All AMMs apply, as appropriate.	
AMM 25	When necessary and appropriate, a qualified botanist will continue to conduct pre-activity surveys to confirm absence of marsh sandwort, La Graciosa thistle, and Gambel's watercress prior to commencing ground-disturbing

Table 5-8. Avoidance and Minimization Measures for Plants
activities in potential habitat areas. If the plants are found during pre-activity surveys, including any Gambel's watercress hybrids, the botanist will flag the area inform all workers of the need to stay out of flagged area.
Park Maintenance: Heavy Equipment Response in all Areas of SVRA of Oceano Dunes District (CA-29)
Potential Effects: Plants trampled/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Minor Grading (less than 50 cubic yards) (CA-30)
Potential Effects: Plants trampled/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Park Maintenance: Boardwalk and Other Pedestrian Access Maintenance (CA-31)
Potential Effects: Plants trampled/crushed; Plants uprooted/removed; Temporary loss of habitat.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Visitor Services: Emergency Response (CA-33)
Potential Effects: Plants trampled/crushed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Limited Trail Riding Area (CA-42)
Potential Effects: Loss or degradation of potentially suitable habitat.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 26 All trails and other areas open to vehicles will be sited with adequate buffers from any occurrences of listed plants.
Other HCP Covered Activities: Cultural Resources Management (CA-45)
Potential Effects: Plants uprooted/damaged/removed.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 27 Plant populations will continue to be restored if a cultural resource project disturbs or destroys a plant population.
Other HCP Covered Activities: Oso Flaco Lake Boardwalk Replacement (CA-48)
Potential Effects: Plants trampled/damaged/removed. Temporary reduction in water quality.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Special Projects (CA-49)
Potential Effects: Permanent and/or temporary loss of potentially suitable habitat.
Avoidance and Minimization Measures: All AMMs apply, as appropriate.
Other HCP Covered Activities: Use of Pesticides (CA-51)
Potential Effects: Habitat disturbance; Exposure to contaminated water and residues; Direct exposure to chemicals.
Avoidance and Minimization Measures: All AMMs apply, as appropriate. AMM 28 CDPR will continue to ensure that formal surveys are conducted for the covered plant species prior to work commencing on the project site. Surveys will continue to be conducted by trained botanists and field assistants. Since population numbers are relatively low, surveys focus on determining the location, distribution, and abundance of covered species. CDPR will continue to ensure that all covered species locations are flagged to alert workers of their presence. Authorized staging areas and access routes will continue to be flagged. All equipment and labor crews will continue to remain in staging areas staging areas or on the designated access routes to reduce the potential for impacts to covered plant species and their habitat. AMM 29 After treatments are initiated, additional surveys will continue to be conducted to identify new populations of covered plants. Regular monitoring of the treatment area will continue to determine the effects of the treatments on the existing populations and their habitat. AMM 30 Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. AMM 31 Pesticide application will continue to be postponed if soil moisture is at field capacity and NOAA or NWS forecasts a storm event will occur within 48 hours following application; or NOAA/NWS forecasts a storm event likely to produce runoff from the treated area will occur within 48 hours following the application. AMM 32 CDPR will continue to avoid occupied covered plant habitat, as feasible. If covered plant habitat must be impacted, CDPR will continue to establish a buffer zone of no less than 15 feet (but typically 25 feet) around individual covered plant species identified during surveys, as feasible. Only hand-weeding will continue to be permitted in these buffer zones. If a buffer cannot be implemented, CDPR will continue to take appropriate precautions, as determined by a qualified biologist/Natural Resource staff. Precautions can include timing the herbicide activities so that they occur prior to the covered plant blooming period, using a monocot focused herbicide, and/or having an experienced herbicide applicator conduct the activities under the direction of a qualified botanist.

Table 5-8. Avoidance and Minimization Measures for Plants	
AMM 33	CDPR will continue to only allow trained, skilled botanists to enter areas where covered plant species occur during treatments.
AMM 34	CDPR will continue to ensure that pesticide applications near known populations of the covered plant species are conducted under the direction of a qualified biologist/Natural Resource staff.
AMM 35	CDPR will continue to ensure that all workers are trained to identify covered plant species that may occur at project site prior to work commencing on site. CDPR will continue to instruct workers how to avoid inadvertent adverse impacts to these species.
AMM 36	CDPR will continue to ensure that all workers are trained in the safe and effective use of herbicides in sensitive habitats.
AMM 37	CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that herbicide application activities do not result in impacts to covered species.
AMM 38	If herbicides are spilled, they will be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements.
AMM 39	CDPR will continue to take the following steps when using herbicide: • Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. • CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made • All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.2 Mitigation Measures

Implementation of AMMs (section 5.3.1) does not necessarily relieve a permittee (or eligible third party) from also having to implement mitigation measures to compensate for impacts to covered species or their habitats. Mitigation measures may be required under either of the following circumstances:

1. If one or more applicable AMM cannot be fully implemented.
2. If unavoidable impacts to covered species or their habitat may occur regardless of full implementation of all AMMs.

Overall, CDPR implements the conservation program, including the AMMs and meeting the biological objectives of the program, which has been successful at offsetting the impacts to covered species from covered activities and allowing CDPR to contribute to covered species recoveries locally and range-wide. For example, the seasonal exclosure and symbolic fencing that is erected each breeding season to protect SNPL and CLTE has been successful at protecting breeding habitat for SNPL and CLTE from both humans and predators thereby increasing reproductive success for these species. The monitoring (section 5.4), predator management (section 2.2.2.1.2), and habitat enhancement (section 2.2.2.1.2) programs are designed to mitigate impacts associated with human use in the HCP area for SNPL and CLTE. The monitoring (section 5.4) and invasive plant and animal control and removal (section 2.2.2.3) programs are designed to mitigate impacts associated with human use in the HCP area for SWPT, CRLF, WSF, and tidewater goby. The habitat restoration efforts such as invasive species removal and fencing of the vegetation islands successfully mitigate impacts to listed plant species. These measures are augmented by offsets.

5.3.2.1 Offsetting Incidental Take of Covered Species

The conservation program outlined in this HCP represents a substantial effort to manage populations of the covered species. This conservation program is based on the best available information on the status, distribution, and threats to the covered species. In particular, this program relies on a three-tiered conservation program:

- Managing species and habitats in perpetuity consistent with the requirements of the California Public Resource Code (e.g., PRC §§5001.2 and 5090.01 et seq.).
- Collecting up-to-date information on covered species status and distribution to help identify and manage threats.
- Implementing measures to eliminate or greatly reduce known threats to covered species and support recovery.

Even with this multi-faceted conservation program, incidental take of covered species will still occur. In May 2023, the USFWS published an updated Compensatory Mitigation Policy (USFWS 2023e). This document defines compensatory mitigation as "compensation or offsets for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources or environments through the restoration, establishment, enhancement, or preservation of resources and their values, services, and functions."

CDPR will meet the mitigation policy with the following comprehensive approaches:

5.3.2.1.1 Western Snowy Plover and California Least Tern

For western snowy plover and California least tern, CDPR is meeting this compensatory mitigation requirement through a documented management program that protects nests, chicks, juveniles, and adults through intensive monitoring, management, and control of predators. In the past two decades, CDPR has dramatically improved nest success, fledge success, and ongoing improvements in adult breeding populations of SNPL and CLTE within the project areas. CDPR has met this compensatory mitigation requirement for SNPL and CLTE.

5.3.2.1.2 Southwestern Pond Turtle

For SWPT, CDPR will restore up to 0.75 acres of dune slack wetland associated with either Surprise Lake or Jack Lake to support a host of rare aquatic species (Map 14). Furthermore, CDPR is committing to conducting predator management with a goal of zero density of invasive exotic predators including crayfish, bullfrog, red-eared slider, and non-native warm water fish at the restored wetland habitat during the term of the HCP. Additionally, CDPR proposes to compensate for the requested level of lethal/injury take through removal of non-native predators during surveys and restoration activities through focused removal of non-native bullfrogs in key areas where SWPT and bullfrogs occupy the same habitats.

Based on peer-reviewed literature, as well as published and unpublished reports from the western United States (1992–2021), predation by invasive species emerged as a top threat for SWPT. Under undisturbed conditions (i.e., no predation by invasive species), only 10-15% of the animals that hatch in a given year may survive until the end of the first year (Hays, et al. 1999, Manzo, et al. 2021). Predation by bullfrogs and other predators may be responsible for the lack of juveniles in many pond turtle populations (Hays, et al. 1999, Nicholson, et al. 2020). In Southern California, bullfrogs have directly contributed to the decline and extirpation of several species of herpetofauna, including SWPT and CRLF (Lawler, et al. 1999, Thomson, Wright and Shaffer 2016). Drought may be the most important threat to SWPT populations in Southern and central California, especially when populations are small and recruitment is low (Manzo, et al. 2021). Conservation strategies should focus on increasing population

resilience to catastrophes by managing other threats, including predation by non-native predators like bullfrog, to maintain larger population numbers and promote recruitment.

Removal efforts will be targeted at breeding areas to increase SWPT survivorship and recruitment. Most of the bullfrog removal will be in areas like Oceano Lagoon, where bullfrog populations are well documented. Additional removal can occur in areas where bullfrogs are found through ongoing surveys. To fully offset take of SWPT, CDPR proposes to remove 10 bullfrogs for each adult or juvenile SWPT incidentally taken (injury or mortality) and 5 bullfrogs for each hatchling incidentally (injury or mortality) taken from covered activities.[94] Also, any injured SWPT would be transferred to a wildlife rehabilitation facility when possible. Offsets for eggs will be through a combination of salvage and transfer to a wildlife rehabilitation facility (where and when possible) and removal of 5 bullfrogs per complete nest or up to 5 eggs in total that are incidentally taken (crushed or damaged) from covered activities. The bullfrog removal will occur during the same turtle breeding season when the incidental take occurs or prior to the next appropriate turtle breeding season as conditions allow. The selective removal of bullfrogs from areas where they co-occur with SWPT will provide benefits to SWPT and fully offset the impacts of taking SWPT.

Additionally, non-native plant invasions can create a serious threat to ecosystem function, including degrading SWPT habitat. As described in section 2.2.2.3, CDPR will continue to implement an invasive plant control program targeting invasive plants in key upland habitats. This invasive plant control, in conjunction with measures enhancing listed plant habitat (CA-15), restoring native dune habitat (CA-16), and controlling riparian invasive plants and overgrown emergent plants (CA-26), will fully offset loss of SWPT aquatic and upland habitat.

5.3.2.1.3 California Red-Legged Frog and Western Spadefoot

For CRLF and WSF, CDPR will restore at least 0.75 acres of dune slack wetland associated with either Surprise Lake or Jack Lake to support a host of rare aquatic species including CRLF and WSF (Map 15). Furthermore, CDPR is committing to conducting predator management with a goal of zero density of invasive exotic predators, including crayfish, bullfrog, red-eared slider, and non-native warm water fish, at the restored wetland habitat during the term of the HCP. Given the clear negative correlation between bullfrog presence and CRLF abundance and the difficulties of meaningful eradication of well-established bullfrog populations (Doubledee, Muller and Nisbet 2003, Adams and Pearl 2007, P. B. Moyle 1973), immediate removal of bullfrogs found in a new location will benefit native aquatic species. These dune lakes were identified because they are isolated from other aquatic habitat that could be an ongoing source of predators. Additionally, these lakes have experienced decline due to lower groundwater levels in the dune complex, possibly connected to nearby groundwater overuse. During some dry years, these lakes have provided poor quality breeding habitat for CRLF and WSF because emergent vegetation reduces available open water habitat that is critical for breeding and tadpole development. CDPR will seek funding through grants or through existing funding sources to implement this restoration project within the first 10 years of the HCP. These lakes can have perennial standing water, but the important wetland features are degraded by the growth of tule and cattails. The restoration projects will establish deep pool habitat to support breeding CRLF with transitional banks and swales to support WSF, La Graciosa thistle, and marsh sandwort, along with other wetland species.

[94] These predator removal numbers are an initial biological goal that will be evaluated over the HCP term to verify that these targets are biologically appropriate and that they meet the overall FESA conservation and mitigation requirements. CDPR may adjust the number and/or age class of individuals removed as part of the adaptive management program that guides the conservation program outlined in this HCP. Any adjustments to these numbers will be in consultation with the USFWS and other knowledgeable individuals.

Similar dune slack restoration projects have been successful on the nearby Guadalupe Nipomo National Wildlife Refuge and the Black Lake Ecological Area (Greenwald 2014, National Fish and Wildlife Foundation 2024, CDFW-OSPR 2023, Kofron, et al. 2020). By restoring important dune slack wetland features and committing to keep them free of invasive aquatic predators, CDPR can fully offset the impacts of taking CRLF and WSF.

Additionally, non-native plant invasions can create a serious threat to ecosystem function, including degrading habitat for CRLF and WSF. As described in section 2.2.2.3, CDPR will continue to implement an invasive plant control program targeting invasive plants. This invasive plant control, in conjunction with measures enhancing listed plant habitat (CA-15), restoring native dune habitat (CA-16), and controlling riparian invasive plants and overgrown emergent plants (CA-26), will fully offset loss of CRLF and WSF aquatic and upland habitat.

5.3.2.1.4 Tidewater Goby

For tidewater goby, CDPR proposes to compensate for the requested level of take through removal of non-native predators during surveys and restoration actions, including focused removal of non-native predators (or other non-native species that are in direct competition for habitats) in key habitats that are critical for the ongoing survival and expansion of goby including in the Arroyo Grande, Pismo Creek, Oso Flaco Creek, and Carpenter Creek Estuaries. For each tidewater goby found incidentally taken, CDPR will remove up to 3 bullfrogs or freshwater invasive fish or up to 5 crayfish from known occupied goby habitat.[95] Non-native predator removal will occur during the same season as the incidental take is recorded or during the next appropriate breeding season.

Additionally, CDPR will commit to monitoring estuary conditions in Pismo and Arroyo Grande Creeks and salvaging (capture and relocate to suitable habitat) tidewater gobies that are isolated in pools or are at danger of mortality from dry estuary conditions. In 2008 and 2009, the Arroyo Grande Creek estuary completely dried up because of drought conditions and upstream surface and groundwater use, which caused a localized extirpation of goby until 2010 when tidewater goby was found again in the estuary. In 2022 the Arroyo Grande Creek estuary experienced dry conditions from adjacent landowner pumping. During these extreme events, isolated, remnant pools supported gobies. Over the course of the HCP, there will be other instances of low estuary water or estuary pools that are separated from the estuary where gobies are at risk of desiccation, predation, or death from poor water quality. CDPR will monitor estuary conditions and, in consultation with USFWS and CDFW, salvage gobies deemed vulnerable from low water conditions to suitable habitats within the same or adjacent watersheds that support tidewater goby. It is not known how often this salvage operation will occur during the 25-year term of the HCP. However, it is foreseeable that conditions similar to 2008, 2009, and 2022 will occur throughout the term of this HCP. CDPR estimates capture and relocation of 50 stranded tidewater gobies over the HCP term.

The combination of predator controls in key habitats combined with salvaging stranded, at-risk tidewater gobies will fully offset the impacts of tidewater goby incidental take.

[95] These predator removal numbers are an initial biological goal that will be evaluated over the HCP term to verify that these targets are biologically appropriate and that they meet the overall FESA conservation and mitigation requirements. CDPR may adjust the number and/or age class of individuals removed as part of the adaptive management program that guides the conservation program outlined in this HCP. Any adjustments to these numbers will be in consultation with the USFWS and other knowledgeable individuals.

5.3.2.2 Offset Conclusion

These proposed offsets through non-native predator removal and habitat restoration and enhancement will be done in combination with other activities that preserve and enhance existing habitats and address known and emerging threats to covered species from HCP activities under an adaptive management program focused on covered species conservation. This combination of adaptive management, habitat enhancement, native predator control and non-native predator removal, and management of threats will completely offset the requested take and will allow covered species populations to thrive within the HCP area. The program outlined in this section (as informed by the biological goals and objectives) will provide species conservation benefits above and beyond the baseline conditions attained through the normal operation of these public lands. The program improves species survival by restoring ecosystem structure and function through physical restoration and removing non-native species that disrupt and outcompete various life stages of the covered species. The conservation program fully offsets the residual impacts from covered activities on SNPL, CLTE, SWPT, CRLF, WSF, and tidewater goby.

CDPR will record the date, location, number, and species of predators taken as part of the offset program, and this information will be available upon request by USFWS. It is expected that CDPR will conduct predator removal efforts in temporal balance with anticipated take of listed species. CDPR will include the non-native predator removal data in annual reports submitted to USFWS (section 6.4.1).

5.4 Monitoring

This section describes the HCP's monitoring program, which may evolve during the life of the HCP through the adaptive management process. Given CDPR's mission and statutory mandate to protect biological resources, much of the program described here has been implemented in the HCP area for many years. Adaptive management will be used to add new monitoring techniques (based on advancements in monitoring methods and changes in the type of information or data needed), modify the monitoring methods, or eliminate monitoring methods that prove ineffective or that have unanticipated impacts on covered species. To maintain a comparable dataset, CDPR will implement the monitoring methods in this section as long as the methods are providing useful information and no changes to the monitoring program have been identified. Any changes to the monitoring program will be reported in the Annual Report (section 5.6).

There are three types of monitoring: (1) compliance monitoring, which tracks the permit holder's compliance with the requirements specified in the HCP and ITP; (2) effects monitoring, which tracks the impacts of the covered activities on the covered species; and (3) effectiveness monitoring, which tracks the progress of the conservation program in meeting the HCP's biological goals and objectives (includes species surveys, reproductive success, etc.). The monitoring program described in this section provides data serving all three types of monitoring, as appropriate.

5.4.1 Western Snowy Plover and California Least Tern

Monitoring SNPL and CLTE populations to estimate distribution, abundance, survival, reproduction, and threats is vital for generating data necessary to evaluate the effectiveness of the conservation program and AMMs. Data collected from monitoring will be used to help revise management and AMMs within an adaptive management framework (section 5.5). The primary objectives of the monitoring program are to:

- Obtain an accurate assessment of the number of breeding pairs of SNPL and CLTE in the HCP area
- Monitor distribution and abundance of SNPL during the non-breeding season

- Determine the fates of SNPL and CLTE nests
- Estimate the fledge rates of SNPL and CLTE chicks
- Document locations of SNPL and CLTE broods
- Identify and help minimize threats to SNPL and CLTE
- Help implement management actions aimed at protecting birds and their nests (e.g., inspect and repair nest exclosures, call rangers to enforce restrictions on closures)
- Determine nest fates and the causes of nest failures
- Identify potential causes and document adult, juvenile, chick, and egg mortality, injury, abandonment, or disturbances
- Document occurrence and sign of predators
- Identify the location of CLTE night roost(s) and estimate the number of birds at the roost(s)
- Document characteristics of SNPL and CLTE habitat
- Evaluate the effectiveness of habitat enhancement and management actions

CDPR will continue to monitor populations of breeding and over-wintering SNPL and breeding CLTE using methods that have been refined over the last decade and detailed in the annual report (Appendix G; (CDPR 2017a). CDPR has developed its monitoring protocol for SNPL and CLTE with guidance from USFWS, CDFW, and a scientific advisory committee (referred to as the Scientific Subcommittee in CDP 4-82-300 A5) composed of biologists from USFWS, CDFW, CDPR, and other technical specialists, as appropriate, to ensure monitoring activities relate specifically to recovery and management objectives and are consistent with the monitoring guidelines in the SNPL Recovery Plan (USFWS 2007a). The results from monitoring will continue to be included in annual reports produced by CDPR and submitted to USFWS (section 6.4.1).

5.4.1.1 Monitoring for Threats to Western Snowy Plovers and California Least Terns

5.4.1.1.1 Breeding Season Monitoring

Daily monitoring will continue to occur in SNPL and CLTE breeding habitat from March 1 through September 30 to identify and reduce threats to SNPL and CLTE, to locate nests, and to collect data to estimate population sizes, survivorship, and reproductive success. Typically, a minimum of four monitors will be present during the morning and early afternoon. As the season progresses, monitoring will increase to include the late afternoon and early evening hours, typically with two staff members.

Monitoring will involve walking to assess or find new nests, as well as scanning for nests and broods from parked vehicles outside the Southern Exclosure and other nesting areas. The open riding area and riding area will be monitored by vehicle daily, as any nests or chicks located in this area will be at risk from recreational activities and require immediate protection. The Dunes Preserve will be monitored on foot. Oso Flaco and vegetation islands, as well as Arroyo Grande Creek and Estuary, Carpenter Creek, Pismo Creek Lagoon will be monitored on foot and from a vehicle. Early morning transect surveys will be conducted daily in the open riding area, with particular attention paid to the boundary of fenced nesting areas, to look for tracks or other sign of CLTE or SNPL movement into the open riding area. The Southern Exclosure and any fenced potential nesting area will be monitored periodically by entering the area on foot as well as by observing the area with binoculars and spotting scopes from a vehicle outside the fenced area. The careful use of a vehicle as a blind has proven effective in monitoring nests, broods, and predators. Vehicle surveys on the shoreline of the Exclosures, South Oso Flaco, and 48-acre foredune area (when closed for nesting) will be conducted during low tide by driving slowly on the smooth, hard-

packed sand of the lower exposed intertidal zone. Observations will be made from a parked vehicle using binoculars and spotting scopes with the area in front of the vehicle carefully scanned before proceeding to the next observation point.

Monitoring will be conducted in a manner to minimize disturbance or adverse effects on adult birds, nests, and chicks. When a monitor enters the Southern Exclosure on foot when chicks are present, monitors in one to four vehicles will be positioned in the open riding area along the east side of the exclosure to watch for disturbance to birds. Monitors will search for chick movement and, if necessary, redirect chicks moving toward the open riding area back towards protected areas.

Monitors will attempt to follow broods hatched within the open riding area when they leave their single-nest exclosures, identify threats to brood movement or safety, obtain assistance as necessary from Oceano Dunes SVRA patrol staff, and oversee the erection of signs and/or symbolic fencing to assure brood safety until they reach a non-vehicle use area of Oceano Dunes SVRA. Should broods engage in foraging activity in the wrack line in the open riding area near a closed shoreline, vehicle traffic will be diverted or regulated to allow safe movement of the brood back to a protected area. If chicks remain in harm's way despite CDPR's efforts to move them into a non-vehicle use area, CDPR will capture them for captive rearing, as described in section 2.2.2.1.2.

Rangers and maintenance crews will be notified if a nest is sighted within the riding area. The fence crew will be dispatched and, if needed, a ranger will respond for traffic control.

5.4.1.1.2 Non-breeding Season Monitoring

During the months of October through February, weekly surveys are conducted for non-breeding SNPL. During these surveys, monitors drive vehicles and walk, searching for non-breeding SNPL, including foraging and/or roosting flocks, in the following areas:

- Approximately 0.5-mile north of Pismo Pier to Grand Avenue
- Grand Avenue south to Post 2
- Post 2 to southern shoreline open riding area boundary
- Oso Flaco (southern shoreline open riding area boundary to Oceano Dunes SVRA southern boundary)

As part of this monitoring effort and at the discretion of an experienced monitor, additional speed limit or protected wildlife signs are posted near foraging and/or roosting flocks of wintering SNPL, and enforcement is increased in these areas, as feasible.

5.4.1.2 Monitoring for Predators

Predators are monitored from March through early September by CDPR and contractors to collect information on predator presence in and around the HCP area. Monitors on foot and from vehicles directly observe mammalian and avian predators and their sign (e.g., tracks, scat, regurgitated pellets, prey remains, depredated nests) and record species, type of sign, behavior (if observed), duration of observation, direction of travel, location, and any characteristics that may identify an individual predator.

Observations of species known to be predators of CLTE and SNPL will be documented as both number of days detected, as well as number of occurrences (mammalian) or sightings (avian). The number of days detected describes the total number of days presence was documented in the nesting area, as described in the SNPL and CLTE Annual Report (Appendix G).

The behavior of gulls will also be recorded as a part of general predator monitoring, as gulls are a known predator of SNPL and CLTE eggs and chicks. CDPR staff and contractors will continue general monitoring

of gulls in and around the Southern Exclosure, Oso Flaco, and other nesting areas to identify potential problem individuals.

5.4.1.3 Banding Western Snowy Plovers and California Least Terns

Banding adult birds (SNPL only) and chicks (SNPL and CLTE) helps to improve the accuracy of estimates of population size, survivorship, reproduction, dispersal, and site fidelity, which enables a more informed assessment of the effectiveness of management activities. CDPR will continue to band SNPL and CLTE chicks. CLTE and SNPL chicks in the HCP area will typically be banded between 1 and 5 days of age. To facilitate identification of individuals without having to recapture birds, SNPL and CLTE chicks receive color-band combinations that can be identified at a distance through binoculars or a spotting scope. CLTE chicks will be banded with numbered aluminum USFWS band on one leg and a blank aluminum band on the other leg and will receive unique color-band combinations by covering both aluminum bands with colored tape. Because of the larger SNPL population size in the HCP area, there are not enough color-band combinations to uniquely color band each chick. Therefore, all SNPL chicks from the same nest will receive color-band combinations unique to the season, so that chicks will have a color-band combination that identifies them as belonging to a specific brood. When there are a limited number of designated combinations available to CDPR, staff will reuse combinations when birds with the combination are known to be dead or after a period of at least 3 years with no sightings in the Pacific coast population's range. CLTE chicks will be weighed prior to banding, as feasible. Banding materials used for SNPL and CLTE chicks may change over time depending on the most current available accepted USFWS protocols as determined by the appointed permitted staff.

Banding methods will not compromise the safety of chicks and will include the following protocols:

- Broods will not be disturbed during climatic conditions such as high wind and extreme cold or heat.
- Chicks will only be pursued for a short period of time, typically less than 2 minutes for a single capture attempt and less than 20 minutes in a single day attempting to capture an individual chick.
- Chicks will be captured by hand, and, when possible, close to the nest location.
- Chicks will be released together after banding of all chicks is completed.
- Monitors may choose to leave chicks unbanded when broods remain in areas with nearby young CLTE or SNPL broods to avoid disturbance to chicks.

5.4.1.4 Permitting for Monitoring and Banding

All monitoring and banding activities will be conducted under applicable state and federal permits. USFWS requires that biologists meet minimum training requirements for different levels of SNPL monitoring activities (USFWS 2007a). All persons monitoring SNPL and CLTE for this HCP will meet current USFWS training requirements and will be permitted by the USFWS, as applicable. Monitoring will be conducted by trained CDPR staff or contracted professionals, as appropriate, to help ensure retention of monitors through the end of the season and for consistency in data collection.

5.4.1.5 Estimating the Size of Breeding Populations

Annual estimates of the distribution and abundance of breeding SNPL and CLTE are necessary to detect long-term trends in population size and to evaluate the effectiveness of conservation measures. Annual estimates of breeding SNPL and CLTE have been obtained in the HCP area for over 2 decades and will continue to be obtained through the permit term. Methods used to estimate the size of the breeding SNPL and CLTE populations are described further in the following sections.

5.4.1.5.1 Western Snowy Plover

The abundance of SNPL is estimated using intensive monitoring of banded birds in the HCP area and supplemented with annual breeding-season window surveys. The USFWS coordinates breeding-season window surveys (generally during the last week in May for the HCP area) to obtain a minimum estimate of the number of breeding SNPL at current, historic, and potential breeding sites throughout the SNPL's geographic range from Washington to California, including the HCP area (section 3.3.1.1). Breeding-season window surveys will continue to be conducted according to protocols developed by the USFWS and published in the SNPL Recovery Plan (Appendix I; (USFWS 2007c).

Intensive SNPL monitoring in the HCP area in recent years has allowed a more accurate estimate of the number of breeding SNPL in the HCP area than provided by USFWS breeding-season window surveys. Individually banded snowy plover adults provide the most accurate means to identify breeding population size, but currently too few banded adults are in the HCP area to rely solely on this method. A minimum number of breeding females is derived from the maximum number of nests active on the same day plus any additional nests hatching 1 day before or initiated 1 day after this date. A minimum number of breeding males is estimated from the highest same day count of active nests and broods (males typically raise the chicks; males with broods 3 weeks of age or older are not included since they could be associated with a new nest) and number of nests initiated the day after the high count. From 2009 to 2017, staff compiled numbers of color-banded adults confirmed breeding; staff adds any number of this group not accounted for on the same day high count, including nests or broods with unknown adults, to the same day high count for the appropriate sex. Beginning in 2018, using a database query, staff created a more accurate method to determine high counts of unbanded males and females actively associated with a nest on any given day and a total number of uniquely banded males and females associated with a nest at any point in the season.

5.4.1.5.2 California Least Tern

Nesting CLTE are intensively monitored in the HCP area (section 5.4.1.6). Monitors check the status of nests and broods daily, which allows for an estimate of the number of breeding pairs. The number of breeding pairs can be represented as a range of breeding pairs. The estimated minimum number of pairs is equal to the maximum number of concurrently active nests and broods. The estimated maximum number of pairs is equal to the minimum number of pairs plus one-half of the value of the minimum number of pairs subtracted from the total number of nests:

Max. no. pairs = min. no. pairs + [(total no. nests - min. no. pairs) / 2]

This assumes nests in addition to those accounted for by the minimum number of pairs are equally divided between renesting pairs and new pairs.

Banding CLTE chicks to brood in 2005, and to individual since 2006, has provided for increased accuracy in counting the number of active CLTE broods on a given date.

5.4.1.6 Monitoring Nesting Success and Fledge Rates of Western Snowy Plover and California Least Tern

In addition to monitoring for threats to SNPL and CLTE, monitors will continue to focus efforts on locating and protecting nests, determining the fate of nests, determining survivorship from chick to fledgling stage, and verifying the recruitment of fledglings into the breeding population of SNPL and CLTE. Monitoring will include the following tasks:

- Counting adult and juvenile SNPL and CLTE
- Locating scrapes and nests

- Floating SNPL eggs to help estimate hatch rates
- Tracking nests to determine their fate
- Collecting behavioral observations
- Tracking chick locations and development
- Recording evidence and observations of predator and human activity
- Noting violations of regulations
- Engaging in informal public contact
- Implementing species-specific protection measures, such as erecting exclosures, and noting where signs and fencing need repair
- Making necessary repairs to the seasonal exclosures, if feasible, or notifying park maintenance staff, if needed

An important goal of the SNPL and CLTE monitoring program is to find and monitor all SNPL and CLTE nests and determine the fates of nests and chicks. Nest locations will be mapped using a GPS receiver connected by Bluetooth to a phone. Some nests may not be mapped using GPS, for example, if it is not possible to map a nest without disturbing the birds, or if nests fail before a GPS unit is available. In such cases, GPS coordinates can be estimated based on landmarks and descriptive notes. Nesting attempts known only by detection of broods will be referred to as unknown location nests.

SNPL and CLTE clutch initiation dates can be estimated from egg-laying dates when known. When SNPL and CLTE nests are found at full clutch, eggs will be floated to better estimate initiation and expected hatch dates. Nests will not be disturbed for egg floating during climatic conditions such as high wind and extreme cold or heat or if approaching the nest will disturb nearby broods. Only those individuals approved by USFWS will float SNPL and only those approved by CDFW and USFWS will float CLTE eggs. In addition, when hatch date is known, the average length of time for nests to hatch (32 days) is used to backdate to the approximate nest initiation. When none of this information is available, nest initiation dates are unknown.

The following are categories of nest fates were used in 2023 and prior years. Additional or modified nest fate categories may be used in the future to be consistent with other CLTE or SNPL sites and based on best available science. Staff examines contents of non-hatching eggs post season to look for evidence of fertilization, which may help determine if eggs were abandoned pre- or post-term.

Hatch: Nest will be considered to have hatched if at least one egg hatches.

Abandoned pre-term: Nest is abandoned prior to the expected hatch date; causes may include, but are not limited to, disturbance or adult mortality.

Abandoned post-term: Nest is abandoned after the expected hatch date; this category includes nests with non-viable eggs.

Abandoned, unknown if pre- or post-term: Nest is abandoned, but it is unknown if abandonment is pre- or post-term.

Depredated: Nest is lost to a predator. If possible, the predator will be identified to species or group (mammalian, avian).

Flooded: Nest is overwashed by tide or flooded by a shifting creek or expanding lagoon.

Failed, eggs removed by staff: Non-viable eggs from nest are removed by staff after incubated well past the estimated hatch date. Non-viable egg removal from active nests is done in consultation with USFWS.

Failed with unknown cause: Nest that disappears before the expected hatch date with cause of failure undetermined.

Unknown fate: Nests that disappear around the estimated hatch date and it is unknown whether the nest hatched or failed.

Wind: Nest buried during periods of high wind; eggs may be typically found almost or completely buried.

Banding and observing combinations on chicks are critical to accurately assessing fledge rates. Monitors will typically search for chicks daily once nests begin hatching, recording observed band combinations to assess survivorship. SNPL chicks surviving to 28 days or older from the time of hatching will be considered fledged. CLTE chicks surviving to 21 days or older will be considered fledged.

5.4.1.7 Monitoring Night Roost and Freshwater Lake Use for California Least Tern

During the breeding season, CLTE may assemble in a night roost. Monitors search for evidence (tracks, roosting scrapes, fecal matter) in the open riding area during daily morning transects and periodically within the Southern Exclosure to identify night roost locations. Monitors search for the night roost at least once per week, weather permitting, and will record the location and total numbers of individuals present as CLTE arrive at dusk or later using a thermal infrared scope. CDPR considers counts will be at a minimum due to the inherent limited visibility of night roosts.

CLTE may frequent bodies of freshwater as sources of prey fish in addition to the near-shore ocean. Staff observe if adults are flying away from the colony in the direction of nearby freshwater lakes or ponds and will survey the freshwater sources for CLTE use, if feasible and depending on property access (section 2.2.2.1.2).

5.4.1.8 Protocol for Dead or Injured Western Snowy Plover and California Least Tern and Abandoned Eggs

If monitors find an injured or dead bird, dead chick, or abandoned egg, they will document the occurrence in a field notebook or other suitable recording system. Documentation will include the location of the individual, carcass, or eggs; details observed of the animal and surrounding area; and other relevant circumstances leading up to the discovery, including tracks in the surrounding area. CDPR staff members who find an injured individual, carcass, or egg will contact the SNPL and CLTE monitors. If the found SNPL or CLTE individual, carcass, or egg appears crushed or could have been impacted by one of the covered activities, the monitor will notify a CDPR Peace Officer immediately to assist in investigating the event. Under current management,[96] CDPR notifies USFWS within 24 hours of an injured or dead SNPL being found with a follow-up email notification sent within 3 working days; CDFW is notified of an injured or dead CLTE within 30 minutes by phone, with an email summary sent by the next business day. The responding Peace Officer will write up an Incident Report. Pictures will be taken of the incident site and the surrounding area. Carcasses that are recovered will be placed into a labeled plastic bag. As directed by USFWS and/or CDFW, the specimen will either be placed in a freezer or will

[96] CDPR may continue to report to the appropriate agency dead or injured CLTE within 30 minutes and dead or injured reports for SNPL and CLTE within 24 hours; however, less frequent reporting (e.g., reporting in the annual report) may be appropriate once the HCP is finalized.

be packed with ice in a cooler and sent via next- or same-day air to a qualified facility (e.g., CDFW Marine Wildlife Veterinary Care and Research Center in Santa Cruz) for necropsy to determine the cause of death. Only monitors with a scientific collecting permit will handle eggs and carcasses. Results of necropsies are reported in the annual report for SNPL and CLTE (section 6.4.1).

Eggs are determined to be abandoned by CDPR staff by placing a camera at the nest or by marking the top of the eggs. If after 24 hours there is no sign of incubation or movement of the marked eggs, the eggs are considered abandoned. Monitors will differentiate, where possible, between abandonment due to adult mortality or due to other reasons. If disturbance from recreation activity or management actions may have disturbed nests and caused abandonment, staff may collect the potentially viable abandoned eggs. Monitors will first assess if any nests with active incubation and non-viable eggs (well past estimated hatch date) are available and will replace the collected potentially viable eggs with the non-viable eggs of the active nest, if feasible and appropriate. Without an available non-viable active nest, staff will transport SNPL eggs to an approved facility (e.g., Santa Barbara Zoo) for captive-rearing (captive-rearing facilities are not available for CLTE eggs). Egg collection and replacement will be conducted only by USFWS-approved monitors. Staff processes abandoned, non-hatching eggs to analyze contents and takes intact eggshell specimens to appropriate egg depositories (e.g., the Santa Barbara Natural History Museum).

5.4.2 Southwestern Pond Turtle

No protocol surveys have been conducted for SWPT. However, exploratory surveys were done at Oso Flaco Lake and Oceano Lagoon in 2024 and 2025. CDPR staff consistently saw SWPT at both locations during these surveys. Based on incidental observations SWPT occur at Oceano Lagoon, Oso Flaco Lake, Arroyo Grande Creek, Jack Lake, and near Pismo Creek. Surveys should be conducted to get baseline data regarding the occurrences in these locations and within other similar habitats. Similar surveys may occur annually if SVRA staff are available and resources allow. Surveys will be conducted at all known and potential SWPT habitats (e.g., Pismo Lake, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Meadow Creek, Oceano Lagoon, Pismo Creek Lagoon, Pismo State Beach Golf Course, Dune Lakes, and Arroyo Grande Creek and Estuary as time and staff allows. Monitoring SWPT will generate data necessary to evaluate the effectiveness of the AMMs. Data collected from monitoring will be used to help refine management and AMMs within an adaptive management framework (section 5.5). The primary objectives of the monitoring program are to:

- Assess the population status of SWPT (e.g., distribution, abundance)
- Identify and monitor threats to SWPT to inform potential responsive management actions
- Help implement management actions aimed at protecting SWPT and its habitat
- Identify and document impacts to SWPT
- Document occurrence and sign of invasive species that affect SWPT
- Document characteristics of SWPT habitat
- Evaluate the effectiveness of habitat enhancement actions

The results from monitoring will be reported in annual reports produced by CDPR and submitted to USFWS (section 6.4.1). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods and changes in the type of information or data needed and subject to review by USFWS.

5.4.2.1 Monitor Population of Southwestern Pond Turtle

A comprehensive survey to document presence of SWPT in potentially suitable habitat, numbers of individuals, quality of habitat, and habitat disturbances (if any) will be conducted within 3 years of ITP issuance. A full park survey can occur annually if SVRA staff are available and resources allow. Surveys will be conducted in accordance with the protocols outlined in *USGS Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion* (2006a), *USGS Western Pond Turtle (Emys marmorata) Trapping Survey Protocol for the Southcoast Ecoregion* (2006b), or updated protocols then in effect. Other methodology, such as e-DNA sampling, may be used. These surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit for SWPT, if required, or a biologist approved by the USFWS. These surveys will be conducted consistent with the Declining Amphibian Task Force Fieldwork Code of Practice (Appendix J; (USFWS 2005b).

5.4.2.2 Monitoring Habitat Quality

During the SWPT surveys, CDPR will conduct qualitative monitoring of SWPT habitat to assess the condition of these habitats and identify potential threats that may exist due to presence of invasive species (section 2.2.2.1.4), erosion, bank degradation, or other habitat changes or impacts from covered activities in adjacent areas. Staff will document observations of informal trails, vegetation trampling, litter, and signs of other recreation activities that could affect SWPT.

5.4.2.3 Monitoring Water Quality

The sources of waters that supply water to SWPT habitat in the HCP area are outside the HCP area and, therefore, out of CDPR control. CDPR will contribute to watershed efforts by monitoring water quality in the HCP area and working with off-site landowners, as feasible, to continue to provide suitable habitat for SWPT. If feasible, CDPR will measure water quality bimonthly at locations with known SWPT populations.

5.4.3 California Red-Legged Frog

Modified protocol-level CRLF surveys have been conducted in the HCP area during the spring and summer since 2017. Sites surveyed, depending on site conditions and availability of staff, include Pismo Lake, Pismo State Beach Golf Course, Pismo Creek Lagoon, Carpenter Creek, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Little Hawaii, and Meadow Creek. Survey results are shown in Table 3-13. Monitoring CRLF will generate data necessary to evaluate the effectiveness of the AMMs. Data collected from monitoring will be used to help refine management and AMMs within an adaptive management framework (section 5.5). The primary objectives of the monitoring program are to:

- Assess the population status of CRLF (e.g., distribution, index of abundance)
- Identify and monitor threats to CRLF to inform potential responsive management actions
- Help implement management actions aimed at protecting CRLF and its habitat
- Identify and document impacts to CRLF
- Document occurrence and sign of invasive species that effect CRLF
- Document characteristics of CRLF habitat
- Evaluate the effectiveness of habitat enhancement actions

The results from monitoring will continue to be reported in annual reports produced by CDPR and submitted to USFWS (section 6.4.1). The following methods are subject to modification within an

adaptive management framework based on advances in monitoring methods and changes in the type of information or data needed and subject to review by USFWS.

5.4.3.1 Monitor Population of California Red-Legged Frog

A comprehensive survey to document presence of CRLF in potentially suitable habitat, numbers of individuals, quality of habitat, and habitat disturbances (if any) is conducted as conditions warrant, e.g., adequate water, past results, presence of bullfrogs, and availability of staff. Surveys are conducted at known and potential CRLF habitats (e.g., Pismo Lake, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Meadow Creek, Carpenter Creek, Oceano Lagoon, Pismo Creek Lagoon, Pismo State Beach Golf Course, Dune Lakes, and Arroyo Grande Creek and Estuary). Day and night surveys typically begin in March and are completed by the end of September to account for the breeding season (between October 1 and June 30) and the non-breeding season (between July 1 and September 30). All surveys will be visual unless a CRLF is observed. If a CRLF is observed, Oceano Dunes SVRA biologists may conduct dipnet surveys (see below for details on dipnet surveys). The surveyor will walk along the entire shore or bank, visually scanning all shoreline or streambank areas and/or use kayaks to survey appropriate habitat along the shoreline as necessary when the shoreline is inaccessible. When duckweed or other floating vegetation is present, the surface of the water will be scanned. Care will be taken not to disturb sediments, vegetation, or any visible larvae. When walking on the bank, care will be taken not to crush root balls, overhanging banks, and streamside vegetation that might provide shelter for frogs. When conducting night surveys, flashlights and headlamps using four to six D batteries or one 6-volt battery will be used in order not to harm frogs with bright spotlights (USFWS 2000a). Limited dipnetting of tadpoles and possible capture and handling of adults or juveniles may also occur. E-DNA surveys and call recordings using Autonomous Recording Units (ARUs), may also be used. These surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit, if required, or a biologist previously approved by the USFWS. These surveys will be conducted consistent with the USFWS survey guidelines (USFWS 2005b) and the Declining Amphibian Task Force Fieldwork Code of Practice (Appendix J; (USFWS 2005b).

5.4.3.2 Monitoring Habitat Quality

During the CRLF surveys, CDPR will conduct qualitative monitoring of CRLF habitat to assess the condition of these habitats and identify potential threats that may exist due to presence of invasive species (section 2.2.2.1.4), erosion, bank degradation, or other habitat changes or impacts from covered activities in adjacent areas. Staff will document observations of informal trails, vegetation trampling, litter, indications of fishing, or signs of other recreation activities that could affect CRLF.

5.4.3.3 Monitoring Water Quality

The sources of waters that supply water to CRLF habitat in the HCP area are outside the HCP area and, therefore, out of CDPR control. CDPR will contribute to watershed efforts by monitoring water quality in the HCP area and working with off-site landowners, as feasible, to continue to provide suitable habitat for CRLF (e.g., flows that maintain water levels through late July; (USFWS 2002); salinities less than 3 ppt when eggs are present and less than 6 ppt when larvae, tadpoles, or adults are present; and temperatures throughout the water column below 71.6°F). If feasible, CDPR will measure water quality bimonthly at locations with known CRLF populations.

5.4.4 Western Spadefoot

No protocol surveys have been conducted for WSF. Based on incidental observations WSF occur at Eucalyptus Tree vegetation Island (one suspected sighting) and Oso Flaco Lake. Surveys should be conducted to get baseline data regarding the occurrences in these locations and within other similar habitats. Given the large and often remote areas within which WSF could potentially occur and the need

for surveys to be conducted during limited periods of adequate rainfall, survey areas will be prioritized based on risks to habitat and potential for enhancement. Monitoring WSF will generate data necessary to evaluate the effectiveness of the AMMs. Data collected from monitoring will be used to help refine management and AMMs within an adaptive management framework (section 5.5). The primary objectives of the monitoring program are to:

- Assess the population status of WSF (e.g., distribution, index of abundance)
- Identify and monitor threats to WSF to inform potential responsive management actions
- Help implement management actions aimed at protecting WSF and its habitat
- Identify and document impacts to WSF
- Document occurrence and sign of invasive species that effect WSF
- Document characteristics of WSF habitat
- Evaluate the effectiveness of habitat enhancement actions

The results from monitoring will continue to be reported in annual reports produced by CDPR and submitted to USFWS (section 6.4.1). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods and changes in the type of information or data needed and subject to review by USFWS.

5.4.4.1 Monitor Population of Western Spadefoot

Surveys to document presence of WSF in potentially suitable habitat, numbers of individuals, quality of habitat, and habitat disturbances (if any) will be conducted. Given the large area of potential habitat, site conditions, survey timing requirements, and available staffing, it is not feasible to survey the entire HCP area every year. The monitoring program will thus prioritize sites for surveys taking into account feasibility of access, potential effects from covered activities, and drought/adequate rainfall effects on survey timing. Surveys will be conducted in accordance with the protocols outlined in *USGS Protocol for Nocturnal Aquatic Species of South Coast Ecoregion Rivers, Streams, and Creeks* (USGS 2006c), or updated protocols then in effect. Survey methods will likely include eye shine/visual encounter surveys conducted in the evening after rainfall events (Department of Defense 2022) and monitoring of known or potential breeding pools. Eye shine surveys in upland habitat (focused along game trails and roads where WSP can easily transverse) may also be pursued during the months of May (starting 1 hour after sunset) and June (starting 2-3 hours after sunset) when adults come out to forage. Presence of adults demonstrates habitat suitability (Alvarez, Jeff, pers. comm. 2025). Pitfall traps, e-DNA, call recordings using Autonomous Recording Units (ARUs), or other methods may also be used. Monitoring methods and survey timeframes are expected to be refined with further surveys and studies. These surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit for SWPT, if required, or a biologist approved by the USFWS. These surveys will be conducted consistent with the Declining Amphibian Task Force Fieldwork Code of Practice (Appendix J; (USFWS 2005b).

5.4.4.2 Monitoring Habitat Quality

During the WSF surveys, CDPR will conduct qualitative monitoring of WSF habitat to assess the condition of these habitats and identify potential threats that may exist due to presence of invasive species (section 2.2.2.1.4), erosion, bank degradation, or other habitat changes or impacts from covered activities in adjacent areas. Staff will document observations of informal trails, vegetation trampling, litter, indications of fishing, or signs of other recreation activities that could affect WSF.

5.4.4.3 Monitoring Water Quality

The sources of waters that supply water to WSF habitat in the HCP area are outside the HCP area and, therefore, out of CDPR control. CDPR will contribute to watershed efforts by monitoring water quality in the HCP area and working with off-site landowners, as feasible, to continue to provide suitable habitat for WSF. If feasible, CDPR will measure water quality bimonthly at locations with known WSF populations.

5.4.5 Tidewater Goby

CDPR will continue to monitor tidewater goby populations to document their distribution in the HCP area, estimate abundance, and assess threats to tidewater goby. Tidewater goby monitoring is vital for generating data necessary to evaluate the effectiveness of the conservation program and AMMs. Data collected from monitoring will be used to help revise management and AMMs within an adaptive management framework (section 5.5). The primary objectives of the monitoring program are to:

- Assess the population status of tidewater goby in the HCP area (e.g., distribution, index of abundance)
- Identify and help minimize threats to tidewater goby, where feasible
- Help implement management actions aimed at protecting tidewater goby and its habitat (e.g., adjust closure boundaries, call State Park angers to enforce restrictions on closures)
- Gather information about tidewater goby's use of HCP area water bodies
- Evaluate whether any CDPR activities may be impacting the fishery or aquatic habitat, and document the impacts of habitat disturbance caused by upstream water management activities
- Identify and document impacts to tidewater goby
- Document occurrence of invasive species that impact tidewater goby
- Document characteristics of tidewater goby habitat
- Evaluate the effectiveness of habitat protection and enhancement actions

The results from monitoring will continue to be reported in annual reports produced by CDPR and submitted to USFWS (section 6.4.1). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods, Recovery Permit conditions, and changes in the type of information or data needed and subject to review by USFWS.

5.4.5.1 Fisheries Monitoring

Fisheries surveys have been conducted within Arroyo Grande Creek and Estuary approximately four times per year since 2003 (Rischbieter 2004) through (Rischbieter 2023). The primary purpose of these surveys is to evaluate the composition and document trends of native fish populations in the HCP area. In addition, these surveys are intended to gather information about various species' use of the habitats within the HCP area, evaluate whether covered activities may be impacting fisheries and aquatic habitat, and documenting the impacts of habitat disturbance caused by upstream water management activities (Rischbieter 2020a).Most information sought is qualitative, while quantitative evaluation has been limited to routine estimation of the approximate abundance of individuals of the respective species collected.

Fisheries surveys will continue to be conducted approximately four times a year at Arroyo Grande Creek and Estuary, at least annually at Pismo Creek Lagoon, which includes lower Carpenter Creek, and at least once every 5 years at Oso Flaco Lake and Creek. Portions of lower Meadow Creek will be surveyed at the

same time as Arroyo Grande Estuary when, in the opinion of the qualified biologist/Natural Resource staff, conditions for sampling appear suitable. Surveys will be conducted using dipnets, beach seine, and direct observation. Electrofishing may be employed upstream of tidewater goby habitat, targeting native freshwater species including steelhead; electrofishing would cease in the unlikely and uncommon event tidewater gobies are observed to have expanded their range into lotic waters. Only methods appropriate for the location and conditions will be used. All surveys will be conducted by a qualified biologist/Natural Resource staff with a USFWS 10(a)(1)(A) Recovery Permit for tidewater goby.

Seining will include conducting approximately 10 to 15 seine hauls among the various waters surveyed. The seine will typically be swept in an arc, with a set pivot point on shore, or dragged across or longitudinally along pool areas that are accessible and unimpeded by vegetation or debris. Longer hauls will be conducted on dates when low numbers of fish are present. The seine will be dragged ashore and checked after each haul for presence of organisms. The organisms will be removed, identified, and released.

Electrofishing will be conducted in a continuous or intermittent effort from a relatively easy access point in Arroyo Grande Creek and in some cases will be limited to areas upstream of the confluence of lower Los Berros Creek, depending on the current distribution (lack of presence at site) of tidewater goby. The distance covered during electrofishing will also be dictated by the hydrologic conditions. The electrofisher will be accompanied by two or three netters who will lift immobilized fish with dipnets. Species will be identified and released (and allowed to recover in a bucket, if appropriate). No electrofishing will be conducted where tidewater gobies are present.

Prior to the commencement of each season's surveys, the USFWS-permitted biologist will advise the appropriate USFWS field office (currently the Ventura USFWS Office) of planned survey activities. Survey reports will be completed and submitted to USFWS following completion of all surveys and will reference each fish sampling episode and descriptions of locations sampled, techniques, species collected, relative abundance observed, habitat and water quality conditions at time of survey, and any relevant anecdotal information or insight to help put observations or recommendations in context. If tidewater gobies have been found in a new location, the permitted biologist must report to the appropriate USFWS field office promptly. If, during a scheduled survey, the permitted biologist experiences unintended tidewater goby mortality, the permitted biologist must notify USFWS within one working day. Recovery Permit Annual Summary Reports will reference the survey reports and will be submitted at the end of each year.

Timing of surveys will be scheduled to coincide with seasonal fishery presence, seasonal and episodic hydrologic (stream course) changes, and other factors that may influence the interaction between park visitors and aquatic resources.

5.4.5.2 Monitoring for Public Use and Upstream Influences

Aquatic areas that support tidewater goby and are near public use areas will be monitored regularly to ensure that public encroachment is not having a negative impact on tidewater goby habitat. Monitors will document observations of any new trails, vegetation trampling, litter, signs of fishing, or signs of other recreation activities that could affect tidewater goby. During monitoring, any litter found will be removed. These additional shoreline surveys will be scheduled based on notable hydrologic events or occurrence of other known disturbances, coordinated in advance with USFWS, when appropriate. Appropriate federal and State authorities will be immediately notified upon observation of upstream disturbance (e.g., unnatural dewatering of stream, illegal dumping or waste discharge) if it appears the disturbance is having, or potentially could have, a detrimental effect on tidewater goby habitat.

The County and their consultants maintain creek and estuary water level gauges and telemetry system at the downstream end of its flood control facility (Arroyo Grande Creek and Meadow Creek), and a County water resources website posts current and limited historic water levels online.

5.4.6 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress

CDPR will continue to conduct monitoring of listed plant populations to document distribution in the HCP area, estimate abundance, and assess threats. Monitoring of these plant populations is vital for generating data necessary to evaluate the effectiveness of the conservation and AMMs. Data collected from monitoring will be used to help revise management and AMMs within an adaptive management framework (section 5.5). The primary objectives of the monitoring program are to:

- Identify and help minimize threats to listed plant species
- Help implement management actions aimed at protecting listed plant species and their habitats (e.g., adjust closure boundaries, call rangers to enforce restrictions on closures)
- Evaluate whether any CDPR activities may be impacting the listed plant's habitats and document the impacts of habitat disturbance caused by upstream water management activities
- Identify and document impacts to listed plants
- Document occurrence of invasive species that affect listed plants
- Document characteristics of listed plant species' habitats
- Evaluate the effectiveness of habitat enhancement actions
- Document the status of populations over time

The results from monitoring will be included in annual reports produced by CDPR and submitted to USFWS (section 6.4.1). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods and changes in the type of information or data needed and are subject to review by USFWS.

5.4.6.1 Monitor Populations of Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, and Gambel's Watercress

Targeted surveys for listed plant species will continue to be conducted regularly to assess the status of plant species, measuring trends and changes in population size to help determine the effectiveness of management actions and identify new or emerging threats during the term of this HCP. Surveys will be performed to document listed plant species in the vegetation islands, foredunes, and backdunes (in coordination with the USFWS as necessary). The evaluation will include documenting species populations, counting individual plants, percent cover, and presence of non-native invasives. Digital technology will be used to record locations and other attributes of the listed plant populations. Aerial or satellite photographs will be used to monitor the increase or decline of listed species populations and habitats on an as-needed basis.

Survey results will be reported annually as described in section 5.6. Through these surveys, CDPR Natural Resource staff will increase their understanding of the relative abundance of listed plant species and the distribution and relative abundance of invasive, non-native plant species, such as European beachgrass and Russian wheatgrass. These surveys will also provide an opportunity to assess any additional threats that may exist due to erosion, invasive or non-native species, or other habitat changes or impacts from activities in adjacent areas.

5.4.6.2 Monitor Exotic Plant Treatment Options

CDPR will monitor the effects of various treatment options on populations of listed plant species and their habitats to assist with determining preferred treatments to improve habitat conditions. If monitoring is required during the SNPL and CLTE breeding season, CDPR will work with USFWS to conduct this work in a manner that avoids impacts to SNPL and CLTE.

5.5 Adaptive Management

Adaptive management is an iterative system of decision making that is particularly useful in the face of uncertainty. Adaptive management is a process that allows flexible management, such that actions can be adjusted as uncertainties become better understood or as conditions change—a "learning by doing approach"—that reduces the uncertainty inherent in resource management. Adaptive management should identify and address the uncertainty by incorporating a range of previously agreed-upon alternatives for addressing those uncertainties, integrating a monitoring program that detects the necessary information, and utilizing a feedback loop that links implementation and monitoring to a decision-making process that results in appropriate changes in management. Adaptive management should help the permittee achieve the biological goals and objectives of the HCP.

This section explains where current levels of uncertainty may necessitate future modifications to the conservation program, potential strategies to address these uncertainties, how the HCP's adaptive management process provisions will work, and how revisions under the adaptive management program will be made.

5.5.1 Adaptive Management Approach

The adaptive management strategy will be an integral part of an operating conservation program that addresses the uncertainty in the conservation of a species covered by an HCP. For the purposes of this HCP, adaptive management is an iterative decision-making process used to examine the effectiveness of the conservation program (e.g., AMMs and monitoring) for meeting this HCP's biological goals and objectives and, if necessary, adjusting management actions based on what is learned. New scientific information and changed conditions or circumstances (section 6.5.1) will also be evaluated to identify modifications to the conservation program components, such as modifications to AMMs.

Monitoring the outcomes of management through the performance standards and success criteria is the foundation of an adaptive approach. The biological monitoring program for the covered species will provide the information and data to assess the effectiveness of the conservation program in meeting the HCP's biological goals and objectives. The adaptive management process helps the conservation program achieve the biological goals and objectives by providing the framework for improving management, monitoring, and AMMs. As part of the adaptive management program, data are evaluated and management actions adjusted based on the relative success of the management actions in meeting the biological goals and objectives.

Based on ongoing adaptive management and monitoring of the covered species and scientific information currently available, CDPR expects that the management actions contained in this HCP represent the best management practices at this time. Therefore, the HCP's conservation program is expected to effectively achieve the HCP's biological goals and objectives. However, there is some uncertainty with resource management techniques and a risk that habitat conditions will change in unexpected ways. The natural systems that the covered species are a part of are inherently variable. Numerous factors (including management actions) affect how a population will respond to natural and human-related influences making the science of managing and predicting the responses of covered species to management inherently uncertain. Furthermore, management techniques not identified in the HCP may become available that may be more effective in achieving the biological goals and

objectives of the HCP. Adaptive management will be utilized to provide management flexibility to best afford protection for the covered species, including in the context of Changed Circumstances (section 6.5.1).

5.5.2 Success Criteria and Performance Standards

The following success criteria and performance standards associated with the goals and objectives for each species will provide a basis for determining success of the overall conservation program.

5.5.2.1 Western Snowy Plover

Additional background on the goals, objectives, and criteria is discussed in section 5.2.1.

Table 5-9. Biological Goals, Objectives, and Success Criteria for SNPL

GOAL: **1. Continue to contribute to SNPL recovery locally and range-wide.**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Manage the SNPL population breeding in the HCP area to meet or exceed the CDPR target of 180 breeding SNPL averaged over a moving 3-year window.	Success will be achieved when the 3-year average for the HCP area meets or exceeds the following target: 1.1.1 The number of breeding SNPL adults in the HCP area meets or exceeds 180.
1.2 Maximize the reproductive success of SNPL in the HCP area to maintain a 3-year moving average of at least 1.0 fledgling per male.	Success will be achieved when the 3-year average for the HCP area meets or exceeds the following target: 1.2.1 The number of fledglings per male in the HCP area meets or exceeds 1.0.
1.3 Increase the habitat quality through habitat enhancement and restoration.	Success will be achieved when: 1.3.1 CDPR is actively eradicating non-native plants found within SNPL breeding habitat. 1.3.2 Cover and food resources are provided in the Southern Exclosure to ensure success of objectives 1.1 and 1.2. 1.3.3 CDPR actively maintains suitable sparse SNPL breeding habitat in the Southern Exclosure area, maintaining the characteristics of primary habitat as defined in section 3.3.1.8 and as indicated by breeding productivity, including the breeding number and fledge rate targets in Objectives 1.1 and 1.2, respectively.
1.4 Reduce predation.	Success will be achieved when: 1.4.1 Predation of nesting SNPL is being actively managed, potential SNPL predators in the HCP area are removed, and predation is reduced. 1.4.2 Predator management plans are developed and implemented in the HCP area, and these plans are

Table 5-9. Biological Goals, Objectives, and Success Criteria for SNPL	
	updated as needed to identify appropriate responses to predators. 1.4.3 Predator management actions are implemented in a timely manner.
1.5 Reduce disturbance by recreational users and predators.	Success will be achieved when: 1.5.1 Take does not exceed levels established in the HCP (section 4.3.2). 1.5.2 Monitors and park staff do not observe any take resulting from trespassing into SNPL nesting areas. 1.5.3 Where needed, symbolic fencing or single-nest exclosures within the open riding area are erected within 2 hours of discovery of a nest with one or more eggs by monitors or park personnel. 1.5.4 Camping or parking by recreational users is not allowed within 100 feet of nesting area fencing (Exclosures, single-nest exclosures, or other closed nesting areas). 1.5.5 The seasonal exclosure and all smaller exclosures (7-foot circular or mini exclosures) are constructed with predator-proof fencing. 1.5.6 All repairs to exclosure fencing are completed within 24 hours of the damage being discovered by or reported to CDPR staff.
GOAL: **2. Minimize conflicts between park users, park operations, and SNPL through a combination of education, avoidance and minimization measures, and enforcement of park rules and regulations.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of SNPL, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.	Success will be achieved when: 2.1.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 2.1.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 2.1.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts. 2.1.4 Annual training programs for staff and concessions include information on the species covered by the HCP and the HCP conservation program.

Table 5-9. Biological Goals, Objectives, and Success Criteria for SNPL	
2.2 Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect SNPL and its habitat.	Success will be achieved when: 2.2.1 Adequate enforcement staff is available to deter and respond to violations observed or reported in the HCP area.
2.3 Implement recreation and other restrictions to avoid and minimize take of SNPL.	Success will be achieved when: 2.3.1 Take does not exceed levels established in the HCP (section 4.3.2). 2.3.2 Monitors and park staff do not observe any take resulting from trespassing in SNPL protected areas.
2.4 Conduct all maintenance and other park operations in a manner that avoids and minimizes take of SNPL.	Success will be achieved when: 2.4.1 All maintenance and other park personnel receive training that informs them of SNPL life history and regulations protecting them. 2.4.2 All maintenance and other park personnel know how to respond to violations of park regulations or SNPL take. 2.4.3 All park staff comply with closures, speed limits, and other restrictions aimed at protecting SNPL, unless emergency conditions warrant otherwise.

5.5.2.2 California Least Tern

Additional background on the goals, objectives, and criteria is discussed in section 5.2.2.

Table 5-10. Biological Goals, Objectives, and Success Criteria for CLTE	
GOAL: **1. Continue to contribute to CLTE recovery locally and range-wide**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Maintain a 5-year running average of 35 breeding pairs of CLTE in the HCP area.	Success will be achieved when the 5-year running average for the HCP area meets or exceeds the following targets: 1.1.1 The minimum number of breeding CLTE pairs in the HCP area meets or exceeds 35.
1.2 Maximize the reproductive success of CLTE in the HCP area to maintain a 3-year running average of at least 0.8 fledgling per nesting pair.	Success will be achieved when the *3-year running average* for the HCP area meets or exceeds the following targets: 1.2.1 The minimum number of fledglings per pair in the HCP area meets or exceeds 0.8.
1.3 Increase the habitat quality through habitat	Success will be achieved when:

Table 5-10. Biological Goals, Objectives, and Success Criteria for CLTE	
enhancement and restoration.	1.3.1 CDPR is actively eradicating non-native plants found within CLTE breeding habitat. 1.3.2 Cover and food resources are provided in the Southern Exclosure to ensure success of objectives 1.1 and 1.2. 1.3.3 CDPR actively maintains suitable sparse CLTE breeding habitat in the Southern Exclosure area, maintaining the characteristics of primary habitat as defined in sections 3.3.1.8 and 3.3.2.8 and indicated by breeding productivity, including the breeding pair number and fledgling targets in CLTE Objectives 1.1 and 1.2, respectively.
1.4 Reduce predation.	Success will be achieved when: 1.4.1 Predation of nesting CLTE is being actively managed, and potential CLTE predator populations in the HCP area are reduced. 1.4.2 Predator management plans are developed and implemented in the HCP area, and these plans are updated as needed to identify appropriate responses to predators. 1.4.3 Predator management actions are implemented in a timely manner.
1.5 Reduce disturbance by recreational users and predators.	Success will be achieved when: 1.5.1 Take does not exceed levels established in the HCP (section 4.4.2). 1.5.2 Monitors and park staff do not observe any take resulting from trespassing in CLTE protected areas. 1.5.3 Where needed, single-nest exclosures within the open riding area are erected within 2 hours of discovery of a nest with one or more eggs by monitors or park personnel. 1.5.4 Camping or parking by recreational users is not allowed within 100 feet of nesting area fencing (Exclosures, large single-nest exclosures, or other closed nesting areas). 1.5.5 The seasonal exclosure is constructed with predator-proof fencing. 1.5.6 All repairs to exclosure fencing are completed within 24 hours of the damage being discovered by or reported to CDPR staff.

Table 5-10. Biological Goals, Objectives, and Success Criteria for CLTE	
GOAL: **2. Minimize conflicts between park users, park operations, and CLTE through a combination of education, avoidance and minimization measures, and enforcement of park rules and regulations.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of SNPL, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.	Success will be achieved when: 2.1.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 2.1.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 2.1.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts.
2.2 Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect CLTE and its habitat.	Success will be achieved when: 2.2.1 Adequate enforcement staff is available to deter and respond to violations observed or reported in the HCP area.
2.3 Implement recreation and other restrictions to avoid and minimize take of CLTE.	Success will be achieved when: 2.3.1 Take does not exceed levels established in the HCP (section 4.4.2). 2.3.2 Monitors and park staff do not observe any take resulting from trespassing in CLTE protected areas.
2.4 Conduct all maintenance and other park operations in a manner that avoids and minimizes take of CLTE.	Success will be achieved when: 2.4.1 All maintenance and other park personnel receive a training that informs them of CLTE life history and regulations protecting them. 2.3.2 All maintenance and other park personnel know how to respond to violations of park regulations or CLTE take. 2.3.3 All park staff comply with closures, speed limits, and other restrictions aimed at protecting CLTE, unless emergency conditions warrant otherwise.

5.5.2.3 Southwestern Pond Turtle

Additional background on the goals, objectives, and criteria is discussed in section 5.2.4.

Table 5-11. Biological Goals, Objectives, and Success Criteria for SWPT	
GOAL: **1. Expand understanding of SWPT status and trends within the HCP area**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Identify and assess the status of SWPT within known occupied and potential habitat.	Success will be achieved when: 1.1.1 Survey methodology optimized for the HCP area is developed. 1.1.2 Surveys are conducted at all known and potential SWPT aquatic habitat areas within the first 3 years of ITP issuance. 1.1.3 A long-term monitoring strategy based on results of the initial survey effort is developed and implemented.
1.2 Refine understanding of threats to SWPT from covered activities and opportunities for habitat enhancement.	1.2.1 All SWPT habitat has been mapped and evaluated for SWPT risks, optimal timing for implementing activities to minimize take, and enhancement potential. 1.2.2 Findings are incorporated into the conservation program consistent with section 5.5.4.
GOAL: **2. Minimize the effects of park operations, visitor activities, and management activities on suitable SWPT habitat**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 When necessary, to limit substantial encroachment that could significantly degrade suitable SWPT habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential SWPT habitat.	Success will be achieved when: 2.1.1 Negative impacts to SWPT or aquatic habitat from substantial public encroachment are not observed.
2.2 Protect habitat by closing informal trails adjacent to occupied aquatic habitat.	Success will be achieved when: 2.2.1 Established trails near aquatic habitat are marked, and informal trails are closed and restored.
2.3 Park operations and management will be carried out in a manner that avoids and minimizes effects on	Success will be achieved when:

Table 5-11. Biological Goals, Objectives, and Success Criteria for SWPT	
SWPT habitat.	2.3.1 All HCP area operations and management incorporate the findings from Objective 1.2. 2.3.2 Protocols for minimizing harm to SWPT habitat are developed and implemented where needed for specific operations.
2.4 Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of SWPT, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.	Success will be achieved when: 2.4.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 2.4.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 2.4.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts.
GOAL: **3. Improve habitat quality by managing invasive predators and enhancing site conditions for all SWPT life stages.**	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Control invasive aquatic predators/competitors of SWPT.	Success will be achieved when: 3.1.1 CDPR removes bullfrogs encountered during surveys and restoration activities. 3.1.2 CDPR can demonstrate removal of at least 10 bullfrogs for each adult or juvenile SWPT incidentally taken (injury or mortality) and 5 bullfrogs for each hatchling incidentally (injury or mortality) taken from covered activities 3.1.3 Natural Resource staff are able to quantify predator/competitor removal and determine how best to focus such efforts. 3.1.4 Within 10 years from time of ITP issuance, CDPR is conducting control of problematic infestations of non-native predators/competitors at high priority sites. 3.1.5 Monitors and park staff do not observe expansion of non-native predator/competitor (e.g., red-eared sliders, bullfrogs, largemouth bass) populations in priority aquatic habitat.

Table 5-11. Biological Goals, Objectives, and Success Criteria for SWPT	
3.2 Enhance SWPT habitat by managing and restoring aquatic and upland site conditions.	3.2.1 Areas of aquatic and upland habitat that could benefit from habitat enhancement have been identified and prioritized. 3.2.2 CDPR is actively implementing non-native plant control and planting native species consistent with developed priorities. 3.2.3 Within 10 years from the time of ITP issuance, CDPR has restored 0.75 acres of dune slack wetland, including conducting ongoing predator management with a goal of zero density of invasive exotic predators.
GOAL: **4. Minimize upstream water quality effects on SWPT and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.**	
Objectives:	**Success Criteria/Performance Standards:**
4.1 Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area, and RWQCB. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.	4.1.1 All staff members and willing landowners are trained on SWPT life history and measures that can be implemented to protect SWPT and their habitat. 4.1.2 Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect SWPT aquatic habitat. 4.1.3 CDPR encourages upstream landowners to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream landowners when possible.

5.5.2.4 California Red-Legged Frog

Additional background on the goals, objectives, and criteria is provided in section 5.2.5.

Table 5-12. Biological Goals, Objectives, and Success Criteria for CRLF	
GOAL: **1. Minimize the effects of park operations, park visitor activities, and management activities on suitable CRLF habitat.**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 When necessary, to limit substantial encroachment that could significantly degrade suitable CRLF habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek	Success will be achieved when: 1.1.1 Negative impacts to CRLF or aquatic habitat from substantial public encroachment are not

Table 5-12. Biological Goals, Objectives, and Success Criteria for CRLF	
Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential CRLF habitat.	observed.
1.2 Protect habitat by closing informal trails adjacent to occupied aquatic habitat.	Success will be achieved when: 1.2.1 Established trails near aquatic habitat are marked, and informal trails are closed and restored.
1.3 Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of CRLF, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.	Success will be achieved when: 1.3.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 1.3.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 1.3.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts.
GOAL: **2. Improve habitat quality by managing invasive predators and enhancing suitable habitat for all CRLF life stages.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Control invasive aquatic predators of CRLF.	Success will be achieved when: 2.1.1 Within 10 years from time of HCP implementation, CDPR is conducting control of problematic infestations of non-native predators and invasive plant species at high priority sites. 2.1.2 Monitors and park staff do not observe expansion of non-native predators (e.g., mosquito fish, crayfish, largemouth bass) in priority aquatic habitat.
2.2 Enhance CRLF habitat by restoring and managing aquatic and upland site conditions.	2.2.1 Within 10 years from the time of ITP issuance, CDPR has restored 0.75 acres of dune slack wetland, including conducting ongoing predator management with a goal of zero density of invasive exotic predators. 2.2.2 CDPR is actively eradicating non-native plants found within CRLF habitat.
GOAL:	

Table 5-12. Biological Goals, Objectives, and Success Criteria for CRLF	
3. Minimize upstream water quality effects on CRLF and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Conduct outreach to, and work with, willing landowners upstream of the HCP area, whose activities affect water quality and quantity in the HCP area, and RWQCB. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.	3.1.1 All staff members and willing landowners are trained on CRLF life history and measures that can be implemented to protect CRLF and their habitat. 3.1.2 Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect CRLF aquatic habitat. 3.1.3 CDPR encourages upstream landowners to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream landowners when possible.

5.5.2.5 Western Spadefoot

Additional background on the goals, objectives, and criteria is provided in section 5.2.6.

Table 5-13. Biological Goals, Objectives, and Success Criteria for WSF	
GOAL: **1. Expand understanding of WSF status and trends within the HCP area**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Identify and assess the status of WSF within known occupied and potential habitat.	Success will be achieved when: 1.1.1 Survey methodology optimized for the HCP area is developed, including identifying priority sites for surveys. Methodology must account for feasibility of access, potential effects from covered activities, and drought/adequate rainfall effects on survey timing. 1.1.2 Surveys are conducted at all priority sites within the first 5 years of HCP implementation, with remaining areas surveyed as feasible and necessary within 10 years. 1.1.3 A long-term monitoring strategy based on results of the initial survey effort is developed and implemented.
1.2 Refine understanding of threats to WSF from covered activities and opportunities for habitat enhancement.	1.2.1 All priority WSF habitat has been mapped and evaluated for risks and enhancement potential. 1.2.2 The remaining habitat has been evaluated for

Table 5-13. Biological Goals, Objectives, and Success Criteria for WSF	
	risks and enhancement potential. 1.2.3 Findings are incorporated into the conservation program, including identifying optimal timing for implementing activities to minimize take, consistent with section 5.5.4.
GOAL: **2. Minimize the effects of park operations, visitor activities, and management activities on suitable WSF habitat**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 When necessary, to limit substantial encroachment that could significantly degrade suitable WSF habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano Lagoon, Arroyo Grande Creek and Estuary, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential WSF habitat.	Success will be achieved when: 2.1.1 Negative impacts to WSF or aquatic habitat from substantial public encroachment are not observed.
2.2 Protect habitat by closing informal trails adjacent to occupied aquatic habitat.	Success will be achieved when: 2.2.1 Established trails near aquatic habitat are marked, and informal trails are closed and restored.
2.3 Park operations and management will be carried out in a manner that avoids and minimizes effects on WSF habitat.	Success will be achieved when: 2.3.1 All HCP area operations and management incorporate the findings from Objective 1.2. 2.3.2 Protocols for minimizing harm to WSF habitat are developed and implemented where needed for specific operations.
2.4 As applicable, provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of WSF, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.	Success will be achieved when: 2.4.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 2.4.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 2.4.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts.
GOAL:	

Table 5-13. Biological Goals, Objectives, and Success Criteria for WSF	
3. Improve habitat quality by managing invasive predators and enhancing suitable habitat for all WSF life stages.	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Control invasive aquatic predators of WSF.	Success will be achieved when: 3.1.1 Natural Resource staff are able to quantify predator removal and determine how best to focus such efforts. 3.1.2 Within 10 years from time of ITP issuance, CDPR is conducting control of problematic infestations of non-native predators at high priority sites. 3.1.3 Monitors and park staff do not observe expansion of non-native predators (e.g., mosquito fish, crayfish, largemouth bass) in priority aquatic habitat.
3.2 Enhance WSF habitat by restoring and managing aquatic and upland site conditions.	3.2.1 Within 10 years from the time of ITP issuance, CDPR has restored 0.75 acres of dune slack wetland, including conducting ongoing predator management with a goal of zero density of invasive exotic predators. 3.2.2 Areas of aquatic and upland habitat that could benefit from habitat enhancement have been identified and prioritized. 3.2.3 CDPR is actively implementing non-native plant control and planting native species consistent with developed priorities.
GOAL: **4. Minimize upstream water quality effects on WSF and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.**	
Objectives:	**Success Criteria/Performance Standards:**
4.1 Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area, and RWQCB. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.	**4.1.1** All staff members and willing landowners are trained on WSF life history and measures that can be implemented to protect WSF and their habitat. **4.1.2** Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect WSF aquatic habitat. **4.1.3** CDPR encourages upstream landowners to cooperate and reduce impacts to water quality

Table 5-13. Biological Goals, Objectives, and Success Criteria for WSF	
	and quantity. CDPR obtains agreements with upstream landowners when possible.

5.5.2.6 Tidewater Goby

Additional background on the goals, objectives, and criteria is provided in section 5.2.7.

Table 5-14. Biological Goals, Objectives, and Success Criteria for Tidewater Goby	
GOAL: **1. Minimize the effects of park operations, park visitor activities, and management activities on suitable tidewater goby habitat**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Protect tidewater goby habitat by closing informal trails in and adjacent to occupied and potential habitat.	Success will be achieved when: 1.1.1 Established trails near occupied habitat are marked, and informal trails are closed and restored. 1.1.2 Informal trails found within riparian habitat adjacent to Arroyo Grande and Pismo creeks will be blocked and restored to original conditions.
1.2 Protect tidewater goby habitat in Arroyo Grande Creek and Estuary by enforcing crossing guidelines.	Success will be achieved when: 1.2.1 CDPR staff is trained in and follows all creek crossing guidelines. 1.2.2 CDPR staff consistently educate the public, implement, and enforce creek crossing guidelines.
1.3 Protect tidewater goby habitat in Pismo Creek Lagoon by pursuing installation of proposed improvements to Pismo Creek.	Success will be achieved when: 1.3.1 Erosion control measures are implemented in Pismo Creek lagoon to stabilize the bank and sedimentation is reduced. 1.3.2 CDPR is actively eradicating non-native plants within Pismo Creek lagoon.
1.4 Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of tidewater goby, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.	Success will be achieved when: 1.4.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 1.4.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 1.4.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts.
GOAL:	

Table 5-14. Biological Goals, Objectives, and Success Criteria for Tidewater Goby	
2. Manage non-native plants and animals to protect all life stages of tidewater goby.	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Control invasive aquatic predators of tidewater goby and other invasive species that reduce tidewater goby habitat quality.	Success will be achieved when: **2.1.1** Within 10 years from time of ITP issuance, CDPR is conducting control of problematic infestations of non-native predators and invasive plant species at all high priority sites. **2.1.2** Monitors and park staff do not observe expansion of non-native predators (e.g., mosquito fish, crayfish, largemouth bass) in priority aquatic habitat.
GOAL: **3. Minimize the effects of upstream water quality/quantity on tidewater goby and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners and water agencies.**	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Conduct outreach to, and work with, willing landowners and water agencies upstream of the HCP area whose activities affect water quality and quantity in the HCP area, working in conjunction with local water agencies and the RWQCB.	Success will be achieved when: **3.1.1** All staff members and willing landowners are trained on tidewater goby life history and measures that can be implemented to protect tidewater goby and their habitat. **3.1.2** Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect tidewater goby aquatic habitat. **3.1.3** CDPR encourages upstream landowners and water agencies to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream landowners and water agencies, when possible.
GOAL: **4. Evaluate the suitability of potential tidewater goby habitat in the HCP area.**	
Objectives:	**Success Criteria/Performance Standards:**
4.1 Cooperate with USFWS efforts to evaluate habitat conditions of other potential tidewater goby habitat within the HCP area.	Success will be achieved when: **4.1.1** CDPR assists USFWS with habitat evaluation and data collection, as appropriate, in Oso Flaco Lake and stream.

5.5.2.7 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress

Additional background on the goals, objectives, and criteria is provided in section 5.2.8.

Table 5-15. Biological Goals, Objectives, and Success Criteria for Listed Plants

GOAL:

1. Protect and enhance habitat for marsh sandwort, La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo Mesa lupine, and Gambel's watercress within the HCP area to sustain or increase their population.

Objectives:	Success Criteria/Performance Standards:
1.1 Restore listed plant habitat.	Success will be achieved when: **1.1.1** New populations and/or areas of suitable habitat for La Graciosa thistle, surf thistle, beach spectaclepod, Gambel's watercress, marsh sandwort, and Nipomo Mesa lupine are established where feasible in the HCP Area in collaboration with the Wildlife Agencies and/or other partners. **1.1.2** Existing occupied sites are successfully managed as evidenced by increased population trends, low cover of invasive species, and successful management of other threats.
1.2 Protect listed plants from public encroachment.	Success will be achieved when: **1.2.1** Monitors and park staff do not observe any adverse impacts resulting from trespassing in fenced or other protected areas. **1.2.2** All La Graciosa thistle found in the vegetated islands within the open riding area are adequately protected (e.g., fenced or other suitable measures). **1.2.3** CDPR is actively eradicating non-native plants found within listed plant habitat. **1.2.4** Interpretive signs are posted in all areas where they are deemed necessary to keep public from trampling plants.
1.3 Close informal trails in and adjacent to listed plant species habitat and restore to original condition.	Success will be achieved when: **1.3.1** Established trails near occupied habitat are marked, and informal trails are closed and restored. **1.3.2** CDPR discourages the proliferation of and or use of non-designated trails through the use of improved directional and regulatory signs, barriers, and fences and through the rehabilitation of closed trails. The more sensitive areas in terms of proximity of public uses to listed plants will be protected at a higher level.

Table 5-15. Biological Goals, Objectives, and Success Criteria for Listed Plants	
1.4 Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of the listed plants, the significance of the HCP area habitats for these species and their recovery, the importance of CDPR's protection and monitoring efforts, the impacts of invasive plants on these species, and the importance of working together to conserve these species and their habitat.	Success will be achieved when: 1.4.1 The HCP's conservation program is incorporated into interpretive and other public outreach programs such as Junior Rangers and social media outreach. 1.4.2 The conservation program's importance and need for visitor compliance is included on signage in locations such as the Safety & Education Center and campground kiosks. 1.4.3 Rangers and other staff include the conservation program's message, as appropriate, during visitor contacts.
GOAL: **2. Manage invasive plants to protect listed plant species habitat.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Control non-native invasive plant species given that invasions of non-native plants create a serious threat to ecosystem function, native biological diversity, and many listed plant species.	Success will be achieved when: **2.1.1** Within 10 years from time of HCP implementation, CDPR is conducting control of problematic infestations of invasive plant species at all high priority sites.
GOAL: **3. Minimize upstream water quality effects on marsh sandwort and Gambel's watercress and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.**	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.	Success will be achieved when: **3.1.1** Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect marsh sandwort and Gambel's watercress habitat. **3.1.2** CDPR encourages upstream landowners to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream landowners, when possible.
GOAL: **4. Collaborate with external agencies to propagate and outplant listed plants to HCP area lands.**	
Objectives:	**Success Criteria/Performance Standards:**

Table 5-15. Biological Goals, Objectives, and Success Criteria for Listed Plants	
4.1 Coordinate with USFWS and other agencies and institutions to explore opportunities for propagation and outplanting of listed plants in the HCP area to enhance existing populations and to support new populations of listed plant species in currently unoccupied but suitable habitat.	Success will be achieved when: **4.1.1** CDPR and external agencies collaborate to develop outplanting plans for listed plant species.

5.5.3 Role of Monitoring in Adaptive Management

CDPR is responsible for monitoring the status of the covered species and the effectiveness of the conservation program. The monitoring program is detailed in section 5.4 and will evaluate the success of the management measures in preserving the quality of existing habitat, preserving covered species populations, and the species' responses to habitat conditions. Monitoring is the cornerstone of adaptive management as it yields results that inform the management decisions. The performance standards and success criteria provide a means to measure whether the conservation program is successful. Therefore, monitoring will continue to provide data that CDPR can rely on to identify successful management and monitoring techniques that achieve the HCP's biological goals and objectives, and it will identify any ineffective management and monitoring techniques. Thus, the monitoring program ultimately provides valuable information for assessing the success of the conservation program in meeting the HCP's biological goals and objectives.

5.5.4 Modifications to the Conservation Program

The ability to modify the conservation program in the future, through the adaptive management process, will provide CDPR the flexibility needed to make management decisions to improve the efficacy and efficiency of the conservation program in achieving the HCP's biological goals and objectives. Adaptive management will also occur when AMMs do not produce the desired outcome or when a population of a covered species exhibits a decreasing trend in size beyond the fluctuations expected with natural variation. In these cases, AMMs will be modified and/or new measures will be implemented to improve the outcome for the covered species. Modifications made through adaptive management will generally reflect changes to the management of habitat and improvements to, or addition of new, AMMs. To summarize, future modifications to the conservation program through the adaptive management process will likely take place in the following situations:

- In response to a decline in the population of a covered species.
- When monitoring indicates that the expected or desired result of a management action did not take place or when monitoring indicates that alternative actions will produce better results.
- When new information from relevant research or programs managing for the covered species indicate that a feasible and superior alternative method for achieving the biological goals and objectives exists.
- When future recovery plans for the covered species recommend recovery strategies (and management actions) that differ from the measures described in this HCP.
- When take of covered animal species approaches or exceeds permitted levels or annual triggers. AMMs may need to be revised if take of covered animal species approaches or exceeds allowable limits or annual triggers (section 5.5.5). If this is the case, then CDPR and USFWS will meet and confer to determine if the HCP AMMs need to be improved. If measures are

determined to be inadequate, or if new techniques are available to more effectively avoid and minimize take, then revisions to the AMMs will be made as soon as practicable.

- When additional threats are identified through monitoring in the HCP area or other monitoring in the region.

Actions associated with adaptive management will be limited to:

- Modifications to the management actions or monitoring methods and timing.
- Modifications to monitoring protocols to improve effectiveness.
- Changes to the management techniques or monitoring methods based on recovery strategies in future recovery plans for the covered species that differ from the measures described in this HCP.
- Additional or different management actions in response to changed circumstances (section 6.5.1), such as non-native species or disease introduction, fire, drought, and climate change/sea level rise.
- Changes to Best Management Practices and AMMs.
- Agreed-upon changes to the size of the Southern Exclosure, as described in section 2.2.2.1.1, if the conditions described in section 5.2.3 are met.
- Minor changes of additions to the Covered Activities that do not introduce significant new biological impacts.

Any changes made pursuant to this section will be described in the Annual Report (section 6.4.1).

5.5.5 Triggers for Revisions to the Conservation Program

If biological monitoring indicates a consistent local population decline for a covered species,[97] if take of a covered animal species approaches or exceeds allowable limits, or if other performance standards are not met, then CDPR and USFWS will meet and confer to evaluate how CDPR implementation of the management actions in this HCP (e.g., conservation actions, monitoring actions, and avoidance and minimization measures) may be contributing to the increased take or population declines. If appropriate and consistent with No Surprises (section 6.5), to the extent ineffective or inadequate management actions are determined to be responsible (in whole or in part) for such population declines or additional take, or if new techniques are available for more effectively implementing management actions as agreed upon by CDPR and USFWS, CDPR will revise the relevant management actions in this HCP as soon as practicable and in accordance with the process set forth in section 6.6.

This HCP includes population and reproductive thresholds for SNPL and CLTE, whereby if the population size or reproductive rate falls below the threshold, additional management actions will be implemented. Population thresholds and an explanation of the thresholds follow:

- The SNPL threshold will be triggered if the HCP area breeding SNPL population percentage of the Unit CA-83 management potential falls below the range-wide average percentage of the 3,000 adult SNPL Recovery Plan target or the Management Potential Breeding Number of 180 (see Goal 1 in section 5.2.1), whichever is lower. The population threshold will be calculated using a

[97] CDPR will monitor regional population trends for covered species to determine if population declines in the HCP area are local or region-wide. CDPR will not be responsible for population declines of covered species that are region-wide.

moving 3-year window to account for range-wide population fluctuation. This threshold was developed to reflect the existing state of the entire U.S. Pacific Coast SNPL population in relation to the SNPL Recovery Plan target of 3,000 adult SNPL. For example, from 2021 to 2023, the average annual total breeding population size throughout the SNPL range was 2,286 birds, based on range-wide window surveys for the U.S. Pacific Coast (USFWS 2023f). To compare the recent range-wide annual average to the SNPL Recovery Plan target, the annual average is multiplied by 1.3, the factor used by USFWS to correct for undercounts on the window survey, and divided by the range-wide 3,000-bird target. This calculation indicates that the average annual range-wide SNPL population from 2021 to 2023 was at 99.1 percent of the 3,000-bird target (i.e., [2,286 X 1.3] / 3000). Therefore, for this time period, during which the range-wide average was slightly below the Recovery Plan goals, the HCP area would have needed to achieve an average population of at least 178 birds (i.e., 180 X 0.991). The number of breeding SNPL in the HCP area has exceeded the 180 bird threshold since the 2013-2015 3-year period as shown in Table 3-4 and Figure 5-1.

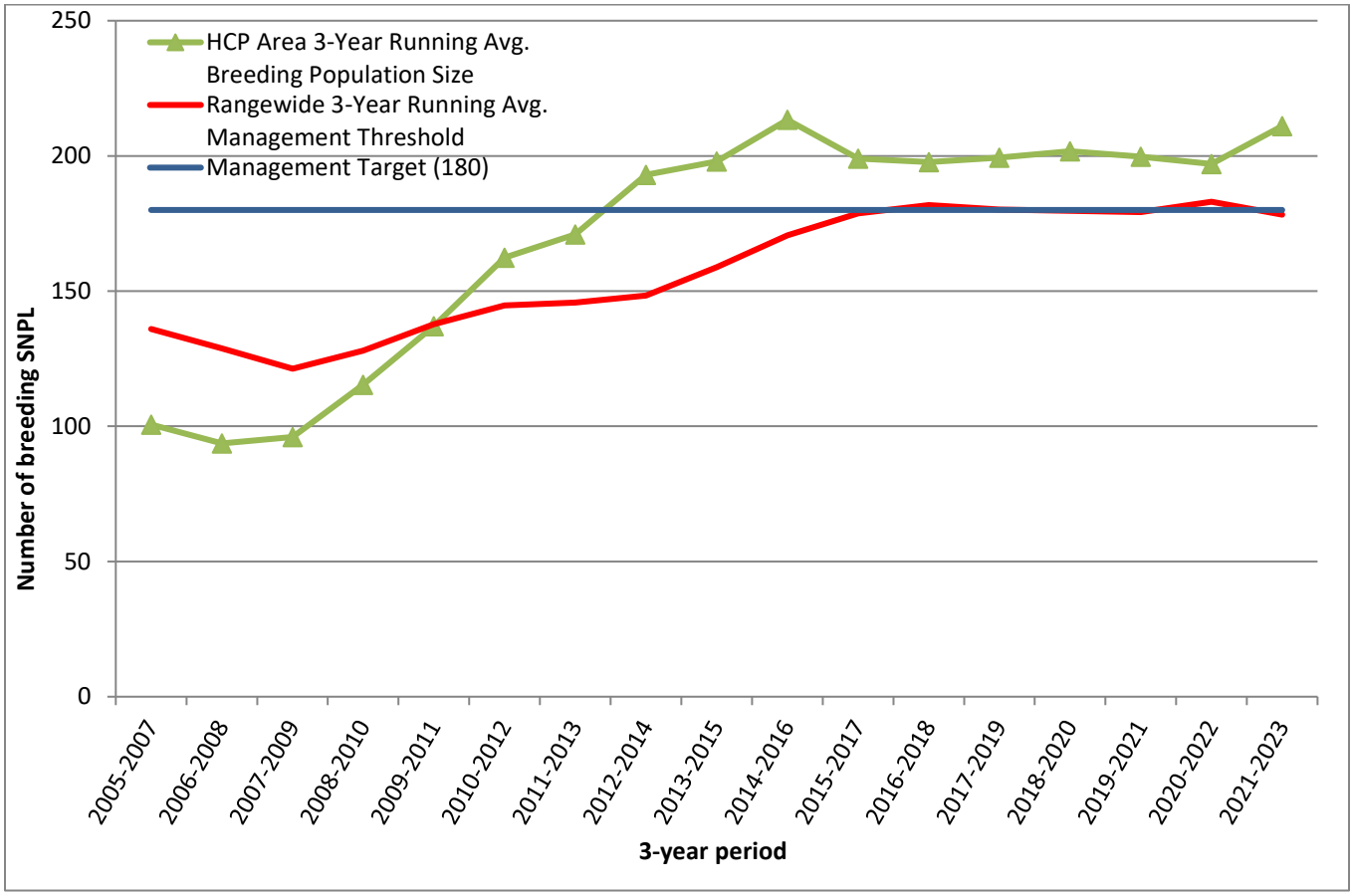


Figure 5-1. Three-year running average population size of breeding SNPL at Oceano Dunes District, management target, and range wide threshold that triggers additional conservation actions, 2005-2023.

- The CLTE threshold will be triggered if the 5-year average number of breeding CLTE pairs falls below 35. CLTE population sizes can exhibit large annual variation. Few CLTE may attempt to breed in some years, and after these low breeding years it may take more than 1 year to return to previous numbers (Table 3-10). The known minimum in 2023 was 41 pairs, and from 2005 to 2022, an average of 40-43 pairs of CLTE nested in the HCP area; however, numbers fluctuated greatly between 23 and 60 pairs. Therefore, the status of the CLTE population will be assessed

based on a 5-year running average of breeding pairs to take into account demonstrated population fluctuations. Under the intensive management regime currently employed in the HCP area (and recommended for this HCP's conservation program) it should be possible for CDPR to sustain a 5-year running average of at least 35 CLTE breeding pairs, as this has generally been attained since the 2001–2005 5-year period, except for the 5-year average ending in 2013 (2009-2013), when it was 34 (Figure 3-7).[98] Therefore, 35 breeding pairs of CLTE across a 5-year window was determined to be an appropriate criterion.

As discussed above, should the management actions not be successful in meeting the specified thresholds within the specified timeframe, CDPR and USFWS will consult to determine whether and how the management actions in this HCP should be modified, as agreed upon by CDPR and USFWS, as soon as practicable.

This HCP also includes annual take number triggers, whereby if annual take numbers approach a defined worst-case scenario for any life stage during any one calendar year from all covered activities other than recovery activities, CDPR will initiate additional consultation with USFWS to identify additional management actions that can be implemented. These annual take triggers follow:

- SNPL: 16 adults/juveniles, 28 chicks, or 37 eggs
- CLTE: 12 adults/juveniles, 8 chicks, or 8 eggs
- SWPT: 5 adults/juveniles/hatchlings and 20 eggs
- CRLF: 5 adults/sub-adults/juveniles, 5 tadpoles, and 2 egg masses
- WSF: 8 adults/sub-adults/juveniles, 15 tadpoles, and 2 egg masses
- Tidewater goby: 5 adults

Under the adaptive management provisions, the HCP can be modified, in coordination with the USFWS, to improve the efficacy and efficiency of the conservation program in achieving the HCP's biological goals and objectives or address new scientific information and/or changed circumstances, as discussed above in section 5.5.4. Changes to the HCP that are substantial in scope and are beyond the scope of the adaptive management program will require the amendment of the ITP and additional review and approval under FESA, CEQA, and NEPA, as described in section 6.6.

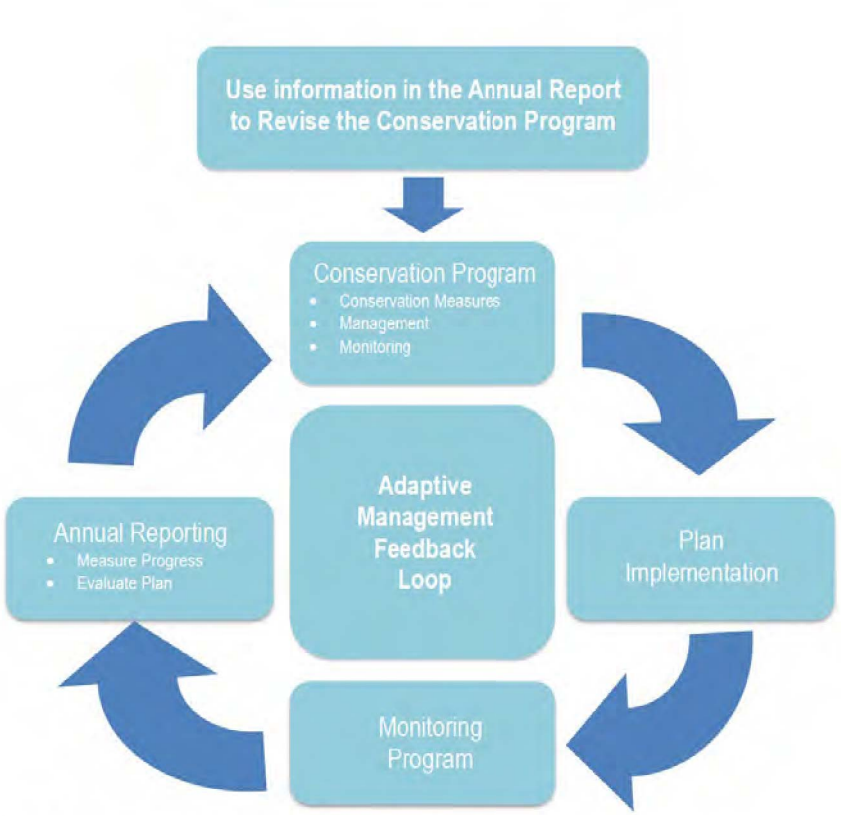
5.5.6 Adaptive Management Process

The USFWS HCP and ITP Handbook (2016) suggests that key components in making the adaptive process meaningful include careful planning through establishing goals and objectives, identifying uncertainties, incorporating a range of management options, implementing a sufficient monitoring program to determine success of the management actions, and a feedback loop from the results of the monitoring program that allows for change in the management strategies. Figure 5-2 presents a conceptual model of the adaptive management feedback loop. The purpose of the adaptive management feedback loop is to ensure that the biological goals and objectives for covered species are being met.

CDPR and USFWS will review the annual reports, including monitoring results and proposed changes or modifications to the conservation program, and will compare the results of monitoring to the goals and objectives for each species. The goal of the collaborative partner review of the annual report will be to measure progress and evaluate plan success through the following:

[98] The 2009–2013 breeding season dropped just below 35, to 34 breeding pairs.

- Assessing status of populations of covered species
- Assessing progress towards achieving the HCP's biological goals and objectives
- Approving or denying modifications to the conservation program recommended in the annual report
- Suggesting modifications in addition to those recommended in the annual report, if necessary



- Source: Adapted from ICLEI – Local Governments for Sustainability
- Figure 5-2. Adaptive Management Process

The structure of the review, annual report requirements, and framework for implementing changes to the HCP identified in the adaptive management process are further described in Chapter 6.

The HCP is intended to contribute to the recovery of the covered species to the maximum extent feasible, consistent with the HCP's other goals and objectives, within the funding levels established in the HCP and within CDPR's mandate for the Oceano Dunes District. It is the intent of the HCP not to preclude or undermine recovery efforts for any of the covered species. Specifically, the HCP will incorporate modifications and/or revisions to the conservation program recommended by USFWS within the adaptive management process and recommendations contained in future recovery plans when such recommendations:

- Are expected to increase the effectiveness of the HCP's conservation and mitigation programs by identifying relevant new information, approaches, techniques, or species protection needs;
- Can be achieved within the HCP area;
- Fit within the overall intent, framework, and funding levels of the HCP; and

- Do not exceed the level of mitigation or financial compensation contemplated in the original HCP, pursuant to the "No Surprises" policy.

All such revisions to the HCP based on future recovery plans will be subject to the adaptive management revisions process described above.

Public Emergency Response

If habitat for a covered species is threatened by fire, flood, or similar emergency, emergency response personnel shall be permitted full access to the area as necessary to protect human life, property and/or plant, fish, and wildlife. If disturbance of habitat is necessary to protect life or to prevent the catastrophic loss of property, emergency personnel will, where time permits, attempt to contact the Resource Agencies (e.g., USFWS) for input on how best to respond to the emergency to maximize preservation of plant, fish, and wildlife species while preserving life and preventing the catastrophic loss of property. If time does not permit such coordination, CDPR will be authorized to permit emergency personnel to disturb habitat as necessary to preserve life and prevent the catastrophic loss of property. After the emergency relief process begins, CDPR will consult with the Resource Agencies to determine the schedule and need for rehabilitating the habitat.

5.6 Reporting

Annual Reports will be submitted to the USFWS. The annual report will include management actions performed that year and results of the year's monitoring activities. Annual reports may include recommended modifications to the conservation program (e.g., management actions; monitoring protocols; and avoidance, minimization, and mitigation measures) as outlined in sections 5.5.4 and 5.5.5.

Annual Reports to the USFWS will include a description of circumstances that made adaptive management necessary and how it was implemented. Further discussion of annual report requirements is provided in section 6.4.1.

This page intentionally left blank.

Chapter 6. Plan Implementation

This chapter describes how the HCP will be implemented and the persons and entities responsible for its implementation.

6.1 Permittee – CDPR

CDPR is the Permittee. The HCP will be implemented out of the Oceano Dunes District, with the District Superintendent having implementation responsibility supported by District and other CDPR staff. The District Superintendent can issue orders addressing the covered activities, including:

- Temporary beach or other park area closures needed to protect wildlife resources.
- Strict enforcement of laws and regulations governing the park, including, but not limited to, no-entry areas, dogs and horses in prohibited areas, dogs off leash in leash-only areas, and motorized vehicle restrictions.
- Permanent closures of trails or beaches.

The District Superintendent will need assistance from OHMVR Division Headquarters and CDPR management to obtain the necessary funding and in providing overall support of the HCP.

6.2 Permitting Agency – USFWS

The USFWS has authority for issuing the ITP and will be responsible for enforcing the provisions of the HCP and permit, assuring CDPR's compliance with the HCP, reviewing annual status reports, and responding to requests for amendments. The USFWS will also maintain and provide information regarding current survey protocols.

Once the USFWS issues the ITP, primary responsibility for implementing the HCP will rest with CDPR. However, the USFWS will receive reports concerning the HCP's implementation and will provide input on CDPR's implementation of the HCP's conservation program, as well as guidance on how to respond to changed circumstances (section 6.5).

6.3 Other Regulatory Agencies

6.3.1 CDFW

CDFW is not a permitting agency for the federal ITP supported by this HCP. It is anticipated, however, that CDFW will consult this HCP as part of its review of supporting documents in consideration of issuing an ITP pursuant to California Fish and Game Code section 2835 (NCCP) or 2081.

6.3.2 California Coastal Commission

The California Coast Commission (CCC) is not a permitting agency but may comment on the HCP and may have some review authority under the Coastal Zone Management Act.

6.4 Plan Oversight

6.4.1 Annual Report

CDPR will submit an Annual Report to USFWS that describes the habitat management and monitoring activities that took place throughout the HCP area during the preceding year and the scope of any

adaptive management modifications to the conservation program recommended for the upcoming year. The Annual Report will include, at a minimum, the following information:

- A summary of the covered activities executed during the reporting period.
- A summary of the impacts from covered activities (e.g., acres graded, amount of vegetation removed, facilities constructed), if any occurred.
- A summary of handling, relocation, and incidental take of any covered animal species that occurred, including cause of take, form of take, take amount, location of take and time of day, and deposition of dead or injured individuals.
- Monitoring results for covered species, including analysis, which may include compliance, effects, and effectiveness.
- A description of AMMs implemented and/or their status.
- A description of circumstances that made adaptive management action necessary, if any, and how it was implemented or is proposed for implementation.
- A discussion of any changed or unforeseen circumstances, including any recommended changes to the conservation program.
- A summary of proposed or approved amendments, if any.
- Funding expenditures and estimates.

The Annual Report will be due January 1 of each calendar year, or portion of a calendar year, during which the ITP will be in effect. If CDPR cannot provide the Annual Report by January 1, it will request an extension by December 15.

6.4.2 Special Project Notification

As discussed in section 2.2.5.10, special projects are those activities that are not considered routine but are required to meet a facility's need (e.g., installing vault toilets, rerouting trails). Such projects fall into two categories:

- Replacement/expansion of existing facilities in the existing facility footprint
- New facilities that are consistent with existing facilities, not to exceed 35 acres over the permit term

At least 30 days prior to constructing a special project that could impact a covered species even with implementation of AMMs (e.g., a project permanently impacting primary SNPL and CLTE habitat), CDPR will notify USFWS of the proposed project. The notification will include a description of the special project to be implemented, including its size and location; the impacts associated with the special project; and AMMs that will be implemented. Within 20 days of receipt of the information, USFWS may request additional information or an opportunity to confer with CDPR on AMMs. USFWS and CDPR may mutually agree on new or modified AMMs or project modifications to further the effectiveness of the conservation program.

6.5 Changed and Unforeseen Circumstances

Section 10 regulations require that an HCP specify the procedures to be used for dealing with changed and unforeseen circumstances that may arise during the implementation of the HCP. In addition, the

HCP Assurances ("No Surprises") Rule (50 CFR §§17.22 (b)(5) and 17.32 (b)(5)) defines changed and unforeseen circumstances and describes the obligations of the permittee and the USFWS.

The purpose of the "No Surprises Rule" is to provide assurance to non-federal permittees participating in habitat conservation planning under FESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

6.5.1 Changed Circumstances

Changed circumstances are defined under the federal "No Surprises Rule" in 50 CFR section 17.3 as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the USFWS and that can be planned for (e.g., the new listing of species, or a fire, or other natural catastrophic event in areas prone to such event)." Changed circumstances must be identified and planned for in the HCP. Anticipating and addressing these changed circumstances adds to the conservation value of the HCP by reducing the potential risks associated with the changed circumstance and provides the USFWS with additional assurance that CDPR will take certain actions if such an event occurs. It also provides CDPR with the assurance that it will not be held accountable to fully compensate for impacts of natural events or incidents that are outside of its control.

If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and these additional measures were already provided for in the HCP's operating conservation program (including AMMs and mitigation measures expressly agreed to in the HCP), then the permittee will implement those measures as specified in the HCP. However, if additional measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the HCP's operating conservation program, the USFWS will not require these additional measures absent the consent of CDPR, provided that the HCP is being "properly implemented" (i.e., the commitments and the provisions of the HCP have been or are fully implemented).

Changed circumstances potentially affecting the HCP area are defined as future events for which it is reasonably foreseeable that such an event could occur during the life of the HCP, and that may negatively affect the covered species and/or their associated habitat within the HCP area. For each changed circumstance, the HCP identifies additional conservation and mitigation measures that will be used to respond to the changes in circumstance. CDPR will be responsible for implementation of such measures as described below. To fund the remedial management to address changed circumstances as well as adaptive management, CDPR will use the existing annual budget and contingency funds (section 7.1). If additional funds are needed to address changed circumstances, CDPR will augment funding via discretionary reallocation of operational funds already allocated to the Oceano Dunes District or request additional funds. CDPR will guarantee that it will request sufficient funding from the legislature on an annual basis to properly implement the HCP (section 7.3). Changed circumstances addressed by this HCP include the following:

- New species listings
- Vandalism
- Drought
- Fire
- Flooding/high tides
- Non-native species or disease introduction

- Predators
- Climate change or sea level rise
- High winds
- Changed park unit designation

6.5.1.1 New Species Listings

Over the 25-year term of the HCP, a species that occurs in the HCP area and that is not covered in this HCP may be listed as threatened or endangered under FESA, and USFWS may designate critical habitat in conjunction with the listing. If a non-covered species becomes listed, the following remedial measures will be taken.

- The potential impacts of covered activities on a newly listed species and its designated critical habitat will be evaluated, including an assessment of the presence of suitable habitat in the impact area.
- CDPR will develop measures to avoid take of the newly listed animal species until the HCP is amended to cover the species or will comply with FESA via other means (e.g., individual section 7 or 10 consultations).

Should a species not covered by the HCP be listed, proposed, or petitioned for listing, CDPR may request that USFWS add the species to the section 10(a)(1)(B) permit. In determining whether or not to seek incidental take coverage for the species, CDPR will consider, among other things, whether the species is present in the permit area and if otherwise lawful activities could result in incidental take of the species. If incidental take coverage is desired, the HCP and permits could be modified or amended (section 6.6), or CDPR may apply for new and separate permits subject to separate funding.

6.5.1.2 Vandalism

Vandalism and other intentional, destructive, illegal human activities have occurred within the HCP area in the past and are reasonably likely to occur in the future. Therefore, vandalism and other intentional, destructive, illegal human activities are considered changed circumstances. For example, destruction of signs, exclosure fences, symbolic fencing, and illegal dumping are considered vandalism. If one of these circumstances occurs and results in adverse impacts on covered species or associated habitat, CDPR will determine the extent of the damage.

In the past, CDPR has addressed these circumstances within its allotted current annual budget. In the future, if one of these circumstances occurs, CDPR, with the concurrence of USFWS, will determine the extent of the damage and identify and implement an appropriate response. CDPR will use a variety of management techniques to control vandalism and to repair damage due to vandalism. These measures may include repairing damaged fencing, installing an alternate type of fencing, repairing signs, or creating obstacles to limit access. The HCP annual budget has been estimated with the assumption that some level of vandalism will occur; therefore, it already accounts for the material, staff time, and equipment costs necessary to repair these damaged areas.

6.5.1.3 Drought

Drought is a natural part of a Mediterranean climate system to which species and natural communities have adapted. However, a prolonged drought could occur, which could cause serious damage to the HCP-area covered species and habitat. Defining when a drought occurs is difficult because there is no universal definition of the conditions that constitute a drought. A generic definition might be a

persistent and abnormal moisture deficiency having adverse impacts on vegetation, animals, or people (NOAA 2016). A drought is generally perceived as a serious departure from normal precipitation conditions.

The California Department of Waer Resources (DWR) has used two primary criteria for identifying drought conditions, including runoff and reservoir storage. However, conditions often vary from region to region, or within a region, and potential changes in rainfall conditions due to climate change are still unknown. Because droughts of up to 6 years have occurred in the last 25 years (DWR 2015), for purposes of this HCP, a drought of 6 years or less is a changed circumstance and a drought longer than 6 years is an unforeseen circumstance and would be addressed in accordance with section 6.5.2. Impacts from drought conditions are likely to impact tidewater goby and CRLF the most.

If a drought of up to 6 years occurs and results in adverse impacts on covered species or associated habitat, CDPR will determine the extent of the damage and notify USFWS of the changed circumstance, or USFWS may notify CDPR. CDPR will ensure that the damage caused by the drought is assessed. Any remedial actions recommended by USFWS to be implemented by CDPR will be consistent with the scope and extent of the AMMs and mitigation measures defined in this HCP (section 5.3.1 and 5.3.2) and within the funding allocated for HCP and adaptive management implementation as outlined in section 5.5 and will include a solution that is accepted by both CDPR and the USFWS. There are few, if any, actions that CDPR could undertake that would ameliorate drought conditions lasting longer than 6 years; thus, a drought lasting longer than 6 years is an unforeseen circumstance.

6.5.1.4 Fire

Fire is a natural component of many ecosystems and natural community types. Fires have occurred in or near the HCP area in the past and could continue to occur within the HCP area. The source of the fire is dependent on the source of ignition, including human mechanisms (e.g., vehicles, cigarettes, campfires) and natural mechanisms (e.g., lightning strike). In general, the California Department of Forestry and Fire Protection has rated the fire potential in the HCP area as moderate. This classification was derived from a combination of fuels, terrain, weather, and other relevant factors.

Fire potential in the HCP area is typically greatest in the months of June through September, when dry vegetation occurs with low humidity. Generally, the vegetation communities within the HCP area are adapted to frequent fire regimes and are expected to naturally recover from fire. However, unnaturally intense fires could damage biological resources and covered species. The coastal areas of San Luis Obispo County have only experienced a few small wildland fires. Therefore, based on historical wildfires, it is expected that the HCP area could experience a small wildland fire that burns up to 20 percent of covered species habitat in the HCP area every 10 years, and this event is considered a changed circumstance. A wildfire that occurs more than once in 10 years or burns more than 20 percent of covered species habitat is considered an unforeseen circumstance.

CDPR will include fire management and protection measures that will minimize the risk of damage to covered species habitats and natural communities from fire outside the normal range. Preventive measures may include fire management measures such as redesigning, reconfiguring, and/or reviewing fuel breaks (e.g., Oceano Campground); working with local fire agencies to improve fire suppression and preparedness and strategies to protect habitat during fire response; and contacting firefighting authorities to identify appropriate strategies to fight fires to minimize habitat damage.

If this changed circumstance occurs in the HCP area, as defined above, CDPR will notify the USFWS of this changed circumstance. CDPR will ensure that the damage caused by the fire is assessed and will ensure the implementation of the following actions:

- Within 1 year after the fire, initiate the appropriate actions, such as habitat restoration, invasive species control, and/or erosion control, in the affected areas to ensure the re-establishment of listed plants and other native vegetation through active or passive means, as appropriate.
- Implement measures through the adaptive management program (section 5.5) in ways consistent with permit obligations.
- If deemed necessary, ensure appropriate erosion control structures and applications (e.g., seeding) are in place prior to the following rainy season.

6.5.1.5 Flooding/High Tides

Over the years, the HCP area and vicinity have experienced flooding events that have resulted in property damage. Floods in the area have caused streams and creeks to overflow and inundate surrounding areas and trees to fall and damage surrounding habitat or structures. King tides can inundate habitat or cause saltwater intrusion in creeks and lakes or creeks to fill with sediment. These issues may be exacerbated with climate change (section 6.5.1.8). Flooding associated with a 100-year event or greater and high tides associated with a 1 percent exceedance probability level or less is considered unforeseen circumstances.

The effects of flooding/high tides on the HCP's covered species would depend on several factors, including the severity of the event, the event duration, and the type of habitat affected. Overall, the adverse effects of flood events on the HCP's covered species are expected to be relatively minor, largely because many of the HCP's covered species are either adapted to flooding (e.g., the California red-legged frog) or are capable of fleeing the harm of such events (e.g., birds). However, in some cases, flood damage to covered species habitat in the HCP area could be significant and could include pond/lagoon damage, sedimentation, downed trees and shrubs, deposits of debris into creeks, and bank destabilization.

If flooding or high tide damage that threatens known populations of covered species occurs in the HCP area during the term of the permit, CDPR, in consultation with USFWS, will develop a plan for implementing measures to correct for flood damage. Measures will include, but not be limited to, the removal of sediment or debris, replacing downed fencing, bank stabilization, erosion control, replanting vegetation, and any other measures determined by consensus agreement between CDPR and the USFWS consistent with permit obligations.. CDPR may begin implementing remedial measures prior to consulting with the USFWS to prevent further loss of habitat or other adverse effects to covered species.

6.5.1.6 Non-native Species or Disease Introduction

Invasive species currently inhabit the HCP area. The conservation program (Chapter 5) includes measures to reduce and prevent infestation of invasive species. Non-native plants and animals will be monitored and mapped as described in section 2.2.2.3. However, a new, aggressive invasive species could possibly invade the HCP area. Similarly, infestations of a new disease that affects covered or dominant species (e.g., chytrid fungus) in the HCP area could be introduced and have a dramatic effect on covered species and/or covered species habitat.

Large infestations (i.e., affecting greater than 50 percent of the HCP area) of a new or existing disease, invasive plant, or invasive animal can become very expensive to control and could substantially impact the operating budget for the HCP. Therefore, for the purposes of this HCP, infestations of new or existing diseases, invasive species, or spread of existing invasive species beyond 50 percent of the baseline condition within the HCP area are considered unforeseen circumstances. The monitoring program (section 5.4) will identify existing invasive species in the HCP area so that new invasive species can be identified quickly and removed.

If a new non-native plant or animal infestation occurs that poses an imminent threat to known populations of any covered species, and control of the infestation will require expenditure of funds in excess of those anticipated for implementation of this HCP, then CDPR, in consultation with USFWS, will assess the extent of the damage. CDPR will prepare a report within 90 days of the discovery of the infestation that describes the extent of the problem and identifies a range of remedial actions. The report will be submitted to USFWS for review. CDPR, in consultation with USFWS, will determine within 90 days what measures will be implemented to address the problem. CDPR has included funds in the annual HCP budget to control known populations of invasive exotic species including veldt grass, European beachgrass, iceplant/hottentot fig, and Russian wheat. Additional funding from the HCP annual budget can also be redirected to new infestations that threaten to degrade occupied habitat of HCP covered species.

Diseases in the HCP area could include chytrid fungus and ranavirus, among others. However, it is unknown whether these diseases are a problem for the covered species populations in the HCP area due to a lack of data. In general, the effects of diseases on the survival and reproduction of covered species in the HCP area is not known. When a disease that could impact a covered species or covered species habitat is detected, CDPR will contact USFWS to collaborate on determining the best method of measurement, monitoring, and eradicating or controlling the disease before it spreads beyond the 50 percent threshold of unforeseen circumstances. Planned responses to the spread of disease will include determining the best method for measurement and tracking the extent, preparing a damage assessment report, recommending and planning actions to address the disease to the extent possible, and responding through the adaptive management program (section 5.5) consistent with permit obligations. A disease that has spread beyond a level that can be effectively controlled (e.g., on a Countywide or Regionwide basis) will be considered an unforeseen circumstance beyond the scope of this HCP.

6.5.1.7 Predators

Predators are currently monitored in the HCP area from February through September by CDPR and contractors to collect information on predator presence in and around the HCP area. Predator management, including hazing, trapping, relocation, and lethal removal, is conducted, as appropriate, to remove predators that are a threat to covered species (section 2.2.2.1.2). Ongoing predator monitoring and management in covered species habitat is expected to alert biologists of any significant changes in predation and trigger a step-up control program for that particular problem. However, at times, a predator can move into covered species habitat quickly and cause harm or mortality of covered species prior to being trapped or lethally removed. If a major change in predation of a covered species is observed, such that more than 50 percent of a covered species population is impacted in 1 year, this will be considered a changed circumstance. If response to an increase in predation could require expenditure of funds in excess of those needed for normal predator management, CDPR, in consultation with USFWS, will assess the extent of the damage to the covered species. CDPR will prepare a damage assessment report within 60 days of the discovery of the problem that describes the extent of the problem and identifies a range of remedial actions. The report will be submitted to USFWS for review. CDPR, in consultation with USFWS, will determine within 30 days what remedial measures will be implemented to address the problem, responding through the adaptive management program (section 5.5) consistent with permit obligations.

6.5.1.8 Climate Change or Sea Level Rise

Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties using statistical tests or other means, and that persists for an extended period, typically decades or longer (Cubasch, et al. 2013). There are many indicators of climate change. These indicators include physical responses, such as changes in surface temperature,

atmospheric water vapor, precipitation, severe events, glaciers, ocean and land ice, and sea level. Climate change is also predicted to include secondary effects such as sea level rise and changing climatic patterns that may affect the frequency of disturbance events such as flooding and fire.

In coastal areas, one of the primary concerns associated with global climate change is the potential for sea levels to rise and for the frequency and intensity of coastal storm events to increase. Until 2050, there is strong agreement among the various climate models for the amount of sea level rise that is likely to occur. After mid-century, estimates of sea level rise become more uncertain; sea level rise projections vary with future projections due in part to modeling uncertainties, but primarily due to uncertainties about future global greenhouse gas emissions and uncertainties associated with the modeling of land ice melting rates.

Potential impacts of climate change within the HCP area include:

- **Reduced groundwater recharge**. The region may see more severe, but not more frequent, rainfall events, leading to quick pulses of runoff. Poor land use practices upstream of the HCP area prevent much of the rain from infiltrating into the ground. This would potentially impact covered species at Pismo Creek Lagoon, Pismo Lake, Arroyo Grande Creek and Estuary, Oso Flaco Creek, and Oso Flaco Lake.
- **Exacerbated impacts of groundwater pumping**. Groundwater pumping leads to the lowering of water tables, causing low flows and dry periods in rivers and streams, contraction of riparian areas and wetlands, and stress to aquatic organisms. Because groundwater use by agriculture and local communities is not monitored, a sustainable level of use has not been identified. As climate change progresses, current usage rates would likely lead to increasingly severe negative impacts to aquatic systems at Pismo Creek Lagoon, Pismo Lake, Arroyo Grande Creek and Estuary, Oso Flaco Creek, and Oso Flaco Lake.
- **Coastal flooding of low-lying areas**. Coastal storms can cause coastal flooding of low-lying areas, inundating economically important infrastructure. The erosive impact of storms could also cause severe damage to coastal developments and facilities. Flooding and high tides potentially affecting the covered species and/or covered species habitat are addressed above in section 6.5.1.5.
- **Fish population impacts**. Climate change is expected to impact fish populations directly through warming ocean waters, increasing ocean acidity, changing currents and nutrient availability, and inundation of coastal wetlands.
- **Increased beach erosion**. Beach erosion will increase in many areas. Other coastal areas may see more sediment deposition (see below).
- **Increased sedimentation**. Sedimentation is likely to increase in marshes, estuaries, and coastal streams. Potential fire and severe storms could exacerbate already high rates of sediment runoff. This could lead to shallower, warmer water, with complete loss of some estuaries due to sedimentation combined with sea level rise.
- **Inundation of coastal marshes and wetlands**. Sea level rise is expected to cause inundation of coastal marshes and wetlands. Many species, including SNPL and CLTE may be affected.
- **Saltwater intrusion**. Saltwater is likely to intrude into estuaries and creeks along the coast, especially in the Arroyo Grande watershed. Flooding could occur in the Arroyo Grande and Grover Beach areas. Willow habitats could be threatened by saltwater, especially near Pismo Beach.

- **Decline in important coastal habitats**. Coastal dune scrub and willow thickets, as well as other important habitats, may decline from changes in temperature, precipitation, and salinity associated with climate change.
- **Shifts in species phenology, ranges, and distribution**. Climate change may precipitate changes in phenology and shifts in the range and distribution of species. A number of ecological responses to climate change in combination with other non-climate stressors could occur in the HCP area. For example, the timing of seasonal events, such as migration, flowering, and egg laying may shift earlier or later. Such shifts may affect the timing and synchrony of events that must occur together. In addition, climate change could play a role in shifting the range and distribution of species and natural communities. This is of particular concern for narrowly distributed species that already have restricted ranges such as the listed plant species in this HCP.

CDPR's response to climate change and, therefore, the delineation of changed circumstances for climate change, is more appropriately gauged by the character and magnitude of the physical and biological changes in covered species and associated habitat types within the HCP area. A major focus of the conservation program is enhancing and actively managing habitat within the HCP area to address various factors that threaten persistence of the covered species populations, including, but not limited to, exotic species. Importantly, the HCP monitoring program is designed to detect changes in the covered species populations and habitats that may result directly or indirectly from climate change. Effects of climate change are also addressed through the closely related remedial responses to changed circumstances of fire, drought, flood, and invasive species. Because of the high level of uncertainty of how natural communities and species will respond to climate change, remedial actions would be implemented through the adaptive management program (section 5.5), consistent with the scope and extent of the AMMs and mitigation measures defined in this HCP (section 5.3.1 and 5.3.2) and limited to the funding allocated for HCP implementation and adaptive management. Management strategies can be adjusted over time as part of the adaptive management process to address climate change issues. Such remedial actions may include those listed below:

- Modified or enhanced monitoring to detect ecological responses to climate change, including threat monitoring.
- Status and trends monitoring of target species identified as the most vulnerable to climate change.
- Targeted control of invasive species that respond positively to climate change.

In addition, if rising sea levels result in a net loss of covered species habitat over the term of the HCP, CDPR will discuss with the USFWS appropriate implementation measures to address these changes. Future actions responding to this changed circumstance will be determined by consensus agreement between CDPR and the USFWS responding through the adaptive management program (section 5.5) consistent with permit obligations.

6.5.1.9 High Winds

Wind speeds[99] between 0 and 30 mph regularly occur in the HCP area (CDPR 2015a, CDPR 2017a, CDPR 2023). Wind speeds between 30 and 45 mph occasionally occur in the HCP area and can cause damage

[99] Wind speeds in the HCP area are measured at an anemometer at 10 meters in height.

to covered species, especially SNPL and CLTE eggs and chicks. As a result, it is appropriate to treat sustained high winds (i.e., winds between 30 and 45 mph) as a changed circumstance. Wind speeds above 45 mph rarely occur in the HCP area and are therefore considered an unforeseen circumstance.

The effects of high winds on the HCP's covered species would depend on several factors, including the severity of the event, the event duration, and the type of covered species habitat affected. Overall, the adverse effects of high wind events on the HCP's covered species are expected to be relatively minor, largely because many of the HCP's covered species are either adapted to high wind or are capable of fleeing the harm of such events. However, in some cases, high wind damage to the HCP area could be significant and could include directly killing a covered species, including chicks, eggs (e.g., if sand buries a nest with eggs), damaging or destroying protective fencing, or damaging or destroying suitable habitat on which covered species rely for breeding, feeding, and sheltering.

Should high winds occur within the HCP area as defined in this section, CDPR will notify USFWS of this changed circumstance. CDPR will ensure that the damage caused by the high winds is assessed and recommend remedial actions. Any remedial actions will be consistent with the scope and extent of the AMMs and mitigation measures defined in this HCP (section 5.3.1 and 5.3.2**)**. Measures will include replacing downed fencing, replanting vegetation, removing debris and downed trees, and any other measures determined by consensus agreement between CDPR and the USFWS consistent with permit obligations.

6.5.1.10 Changed Park Unit Management

During the HCP term, legislative, permitting, or other actions could modify the nature and extent of allowable recreational uses with the HCP area. If such modifications substantially change management within the HCP area, CDPR would consult with USFWS and may revisit the need for an ITP.

6.5.2 Unforeseen Circumstances

Unforeseen circumstances are defined in 50 CFR section 17.3 as changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by plan developers and the USFWS at the time of the HCP's negotiation and development and that result in a substantial and adverse change in status of the covered species. The purpose of the "No Surprises Rule" is to provide assurances to non-federal landowners participating in habitat conservation planning under the FESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

In case of an unforeseen event, the permittee will immediately notify the USFWS staff who have functioned as the principal contacts for the HCP. In determining whether such an event constitutes an unforeseen circumstance, the USFWS will consider, but not be limited to, the following factors: size of the current range of the affected species; percentage of range adversely affected by the HCP; percentage of range conserved by the HCP; ecological significance of that portion of the range affected by the HCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the HCP; and whether failure to adopt additional measures will appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

If the USFWS determines that additional AMMs and/or mitigation measures are necessary to respond to the unforeseen circumstances where the HCP is being properly implemented, the additional measures required of the permittee must be as close as possible to the terms of the original HCP and must be limited to modifications within any conserved habitat area or to adjustments within lands or waters that are already set aside in the HCP's operating conservation program. Additional measures will involve the

commitment of additional land or financial compensation or restrictions on the use of land or other natural resources otherwise available for modification or use under original terms of the HCP only with the consent of the permittee. Thus, in the event that unforeseen circumstances adversely affect any of the covered species during the life of this HCP, the permittee will not be required to provide additional financial compensation, land, or land restrictions beyond those required by the HCP at the time of issuance of the ITP without its consent. This prohibition does not; however, affect the requirements for responding to changed circumstances as described in section 6.5.1.

6.6 Amendments

Amendments to the ITP and the HCP may be proposed by CDPR and/or USFWS. Any amendments made must be in accordance with all applicable legal requirements, including, but not limited to, FESA, NEPA, USFWS permit regulations, and CEQA permit regulations. The party proposing the amendment(s) will provide to the other two parties a written statement of the reasons for the amendment(s) and an analysis of the effect of the amendment(s) on the environment, covered species, and the implementation of the HCP. The categories of amendments that are recognized, in order of significance, include administrative changes, minor modifications, and major amendments. Each amendment type is described in more detail in the following sections.

6.6.1 Administrative Changes

Administrative changes are internal changes or corrections to HCP implementation that do not require preauthorization from USFWS. Administrative changes will not result in any changes to the impacts analysis, conservation program, or decision documents. Administrative changes will be made in writing and documented by CDPR. USFWS will be provided a summary of administrative changes in each annual report. Examples of administrative changes are listed below.

- Day-to-day implementation decisions, such as modifying timelines for installing exclosures where the ultimate date of exclosure completion is not modified.
- Conducting additional monitoring surveys.
- Modifying HCP monitoring protocols to align with USFWS monitoring protocols as they may be modified in the future.
- Adopting new monitoring protocols that may be promulgated by USFWS in the future.
- Annual adjustments to the HCP funding program to keep pace with inflation.
- Minor administrative changes, including, but not limited to, change in personnel or mailing addresses.

6.6.2 Minor Amendments

Minor amendments are changes that do not adversely affect the impact assessment or intent of the conservation program described in the HCP and do not adversely affect the ability of CDPR to achieve the biological goals and objectives of the HCP. Minor amendments will also not change the amount of take, add new species, or significantly change the boundaries of the HCP. In addition, minor amendments will not change the scope or nature of the covered activities and will not trigger a new NEPA analysis. Minor amendments do not require an amendment to the permits, but they do require pre-approval by USFWS before being implemented. Examples of minor modifications are listed below.

- Corrections of errors in the HCP that do not change the intended meaning or obligations.
- Corrections of spelling errors.

- Correction of any tables or appendices in the HCP to reflect previously approved amendments to the HCP or the permit.
- Minor corrections to the HCP boundaries or other insignificant mapping errors.
- Updates to the land cover map or to species occurrence data that are consistent with the predictions and expectations of the HCP.
- Minor changes to the biological goals or objectives in response to adaptive management.
- Modifying the design of studies or implementing new studies.
- Modification of monitoring protocols to improve the effectiveness of monitoring efforts, but not in response to changes in monitoring protocols from USFWS.
- Modification of existing or adoption of additional AMMs that improve the likelihood of achieving HCP species objectives.
- Discontinuing implementation of AMMs if they are ineffective.
- Adoption of new AMMs that improve the likelihood of achieving the biological goals and objectives.
- Minor changes to the reporting protocol.
- Modification of existing or adoption of new performance standards and success criteria if monitoring, research, and/or new information indicate that the initial performance standards and success criteria need revision.
- Modification of existing or adoption of additional covered species objectives where such changes are consistent with achieving covered species and overall HCP goals.
- Use of new pesticides consistent with manufacturer's label as long as the USFWS have analyzed and agreed that no new impacts to covered species will occur.
- Any other types of modifications to the HCP that are minor in relation to the HCP's goals and that USFWS has analyzed and agreed to.

6.6.2.1 Minor Amendment Process for Section 10(a)(1)(B) Permit

Minor amendments may be made to the HCP by CDPR and/or USFWS. Except where another process is specifically identified under the terms of the HCP with respect to particular types of modifications or as provided below, the party proposing a minor amendment must provide notice to the other parties. Such notice will include a statement of the reasons for the proposed amendment and an analysis of its environmental effects, including its effects on the implementation of the HCP and on covered species.

The parties will use best efforts to respond to proposed amendments within 60 days of receipt of such notice. Except as otherwise provided under the terms of the HCP, proposed amendments will become effective upon all other parties' written approval or as otherwise provided under the terms of the HCP.

USFWS may object to a proposed minor amendment only upon a written statement that the federal permit or the HCP would not meet the requirements of FESA section 10(a)(2)(B). USFWS will not propose or approve minor amendments to the HCP if USFWS determines that such modifications will: 1) result in operations under the HCP that are significantly different from those analyzed in connection with the original HCP; 2) result in adverse effects on the environment that are new or significantly different from those analyzed in connection with the original HCP; or 3) allow significant additional take not analyzed in connection with the original HCP. Where possible, before rejecting a proposed minor

amendment, USFWS will first consult CDPR and suggest reasonable conditions or alterations to the proposal which, if agreed to by CDPR, would permit USFWS to approval the proposed minor amendment.

CDPR can object to a proposed minor amendment upon any reasonable basis. If, for any reason, a receiving party reasonably objects to a proposed minor amendment, and the objection is not resolved by any conditions or alterations, the proposed minor amendment will be processed as a major amendment of the federal and/or state permit.

6.6.3 Major Amendments

Major amendments to the HCP and permit are changes that may affect the impact analysis or the scope of the HCP and conservation program. Major amendments to the HCP may also increase the amount of take, add new species, or change significantly the boundaries of the HCP. Major amendments require amending the HCP and the ITP through the same formal process as the original HCP and permit, including NEPA/CEQA review, a Federal Register notice, an internal section 7 consultation with the USFWS. Major amendments will often require additional public review and comment.

CDPR will submit a major amendment to USFWS in a report that includes a description of the need for the amendment, an assessment of its impacts, and any alternatives by which the objectives of the proposal might be achieved. Examples of changes that will require a major amendment include, but are not limited to, those listed below.

- Revisions of the permit area boundary, including revisions necessary due to land acquisition, that do not qualify for a minor modification.
- Addition of species to the covered species list.
- Increasing the allowable take limit for existing covered activities, changing the form of take, or adding new covered activities to the HCP.
- A major change to a conservation program milestone (e.g., extending a deadline).
- Revisions to any important action or component of the conservation program under the HCP, including funding, that may substantially affect levels of authorized take, effects of the covered activities, or the nature or scope of the conservation program.
- A major change in the biological goals and objectives or AMMs if monitoring or research indicates that that a biological goal or objective and/or AMM is not attainable.
- Modifications to covered activities that could affect levels of authorized take.
- Extending the permit term beyond 25 years.
- Changing the funding so that it affects the ability of the permittee to implement the HCP.

6.6.3.1 Major Amendment Process for the Section 10(a)(1)(B) Permit

To amend the section 10(a)(1)(B) permit, the Applicant will submit a formal application to USFWS. This application must include a revised HCP, a permit application form, any required fees, and the required compliance document under NEPA. The appropriate NEPA compliance process and document will depend on the nature of the amendment being proposed. A new scoping process may be required, depending on the nature of the amendment. If additional scoping is deemed appropriate and necessary, USFWS will publish a Notice of Intent in the Federal Register to initiate the scoping process. Upon submission of a completed application package, USFWS will publish a notice of the proposed application

in the Federal Register, initiating the NEPA and HCP review process. After public comment, USFWS may approve or deny the permit amendment application.

6.7 Enforcement

The provisions of this HCP are enforceable through the terms and conditions of the ITP issued by the USFWS.

6.8 Suspension/Revocation

The USFWS may suspend or revoke the permit if CDPR fails to implement the HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. Suspension or revocation of the section 10(a)(1)(B) permit, in whole or in part, by the USFWS will be in accordance with 50 CFR sections 13.27-29, 17.22 (b)(5), and 17.32 (b)(5), as may be amended over time.

6.9 Federal Permit Renewal

When the ITP expires, CDPR is no longer protected from take that may occur as a result of its management of the HCP area, provided that the covered species are still listed at the expiration of the permit. Upon expiration, the section 10(a)(1)(B) permit may be renewed without the issuance of a new permit, provided that the permit is renewable, and that biological circumstances and other pertinent factors affecting covered species are not significantly different than those described in the original HCP (50 CFR §13.22). To renew the permit, CDPR will submit to the USFWS, in writing, all of the following:

- A request to renew the permit.
- Reference to the original permit number.
- Certification that all statements and information provided in the original HCP and permit application, together with any approved HCP amendments, are still true and correct, and inclusion of a list of changes.
- A description of any take that has occurred under the existing permit.
- A description of any portions of the project still to be completed, if applicable, or what activities under the original permit the renewal is intended to cover.

If the USFWS concurs with the information provided in the request, it will renew the permit consistent with permit renewal procedures required by federal regulation 50 CFR section 13.22. If CDPR files a renewal request and the request is on file with the issuing USFWS office at least 30 days prior to the permit's expiration, the permit will remain valid while the renewal is being processed, provided the existing permit is renewable. However, CDPR may not take listed species beyond the quantity authorized by the original permit or change the scope of the HCP. If CDPR fails to file a renewal request within 30 days prior to permit expiration, the permit will become invalid upon expiration. CDPR must have complied with all annual reporting requirements to qualify for a permit renewal.

6.10 Permit Transfer

Permit transfers usually are the result of an exchange in the ownership of the covered lands (i.e., HCP area). The new owner will assume the responsibilities associated with the HCP and will also expect to receive the benefits of the permit. An assumption agreement will be prepared and will outline the roles and responsibilities of all the parties including the USFWS and address any outstanding obligations and

how they will be completed. The assumption agreement will be a joint submittal by the transferor and transferee as prescribed by 50 CFR section 13.25 or it can resemble a memorandum of understanding.

A partial permit transfer can also be obtained and works the same way as a full permit transfer, except that only a portion of the HCP responsibilities or permit area will change ownership. The division of the HCP area and covered species will be addressed in the assumption agreement and ITP.

The administrative process to transfer a permit is similar to the minor amendment process (section 6.6.2) and will not require public notices. In a complete transfer, the USFWS will issue an amended permit to the new owner. In a partial transfer, the USFWS will issue an amended permit to the original permittee and a new permit to the new owner. Any permit issued will retain the expiration date of the original permit; however, the permittee or transferee can request a permit renewal to alter the expiration date.

In the event of a full or partial permit transfer, the new owner(s) will submit: a new permit application form (3-200-56), a permit fee, and written documentation providing assurances pursuant to 50 CFR section 13.25 (b)(2) that the new owner will provide sufficient funding for the HCP and will implement the relevant terms and conditions of the permit, including any outstanding minimization and mitigation. The new owner(s) will commit to all requirements regarding the take authorization and mitigation obligations of this HCP unless otherwise specified in writing and agreed to in advance by the USFWS.

This page intentionally left blank.

Chapter 7. Funding

7.1 Costs of HCP Implementation

Implementing the HCP will require the expenditures of funds by CDPR on par with the funds spent on the conservation program in the 2023/2024 Fiscal Year. The estimates account for all personnel time and equipment. All amounts are in 2024 dollars unless otherwise noted.

Table 7-1 outlines the annual costs to implement the covered activities by major expenditure category. The Oceano Dunes District estimates that the annual implementation cost of the HCP will be approximately $3,000,000 (Table 7-1).

Table 7-1. Annual HCP Expenses Fully Implemented

Expenditure	Annual Cost
Staff Costs	$1,375,633
Staff Benefits	$580,924
Materials	$157,000
Vehicle Use	$91,000
Contracts	$704,650
One-Time Expense	$84,000
Contingency/Changed Circumstances	$50,000
Total Annual HCP Expenditure	*$3,043,207*

Table 7-2 breaks out the annual cost of implementing the HCP by major expense categories for each taxon or taxonomic group (in the case of plants).

Table 7-2. Annual HCP Implementation Costs Per Covered Species by Taxon (taxonomic group for plants) and Expense Category

Taxon	Staff Salary[1]	Staff Benefits[1]	Materials	Vehicles	One-Time Costs	Contracts	Total
SNPL/CLTE	$1,214,554	$508,437	$144,000	$85,000	$25,000	$604,650[2]	$2,581,641
Western Pond Turtle	$16,053	$7,224	$1,000	$1,000	$2,000	$10,000[3]	$37,277
CRLF	$16,053	$7,224	$1,000	$2,000	$10,000	$15,000[3]	$51,277
Western Spadefoot	$16,053	$7,224	$1,000	$1,000	$2,000	$10,000[3]	$37,277
Tidewater Goby	$14,146	$6,366	$2,000	$1,000	$10,000	$15,000[3]	$48,512
Listed Plants	$30,004	$13,502	$1,000	$1,000	$10,000	$50,000	$105,506
Reporting	$68,770	$30,947	$7,000	-	$25,000	-	$131,717
Other Items of Expense	-	-	-	-	$50,000	-	$50,000

Table 7-2. Annual HCP Implementation Costs Per Covered Species by Taxon (taxonomic group for plants) and Expense Category

Taxon	Staff Salary[1]	Staff Benefits[1]	Materials	Vehicles	One-Time Costs	Contracts	Total
Total[4]	$1,375,633	$580,924	$157,000	$91,000	$134,000	$704,650	$3,043,207

Notes:

[1] Salary and benefits includes field time for monitors and operational costs such as signage; exclosure fence installation, maintenance, and removal; public outreach; habitat enhancement; and law enforcement specific to covered species protection.

[2] Includes banding, predator control, exclosure fence installation and removal, habitat enhancement.

[3] Includes monitoring.

[4] Totals may not add up precisely due to rounding.

Most of the annual funding to implement the HCP covers the management activities and AMMs associated with the SNPL and CLTE management program. Annual costs specific to that part of the conservation program are provided in Table 7-3.

Table 7-3. SNPL and CLTE Tasks Full HCP Implementation Costs

	Staff Salary	Staff Benefits	Contracts	Equipment	Other Expense	Total
Monitoring	$943,545	$404,595	-	$25,000	$85,000	$1,458,140
Banding	-	-	$149,900	-	-	$149,900
Predator Control	-	-	$329,750	-	-	$329,750
Exclosure Fence Installation and Removal	$136,963	$61,634	$101,000	$100,000	$18,000	$417,597
Exclosure Fence Maintenance	$28,127	$12,657	-	-	$2,000	$42,784
Habitat Enhancement	$105,919	$29,551	$24,000	$10,000	$8,000	$177,470
Other Tasks	-	-	-	-	$6,000	$6,000
Total	$1,214,554	$508,437	$604,650	$135,000	$119,000	$2,581,641

Note: Totals may not add up precisely due to rounding.

Over the projected 25-year term of the HCP, the estimated total costs of implementing the HCP are expected to run between approximately $97 to $111 million in inflation-adjusted dollars. Table 7-4 shows the breakout in inflation-adjusted costs at varying rates of inflation.

Table 7-4. Costs Over the Life of the HCP

Estimated Annual Cost (2024 Dollars)	Annual Inflation Rate (%)	Years	Implementation Over 25-Year Life of HCP
$3,043,207	2	25	$97,474,832
$3,043,207	2.5	25	$103,949,146
$3,043,207	3	25	$110,953,088

CDPR will pay all costs associated with implementing the HCP's conservation strategy, including AMMs. In recognition of the fact that future costs for these activities, especially activities that are not yet being implemented, are estimates, the actual incurred costs may be less or more than is shown. If the actual costs for HCP implementation are higher than estimated in Table 7-1 through Table 7-3, CDPR agrees to pay the actual costs.

7.2 Funding Source(s)

Administrative costs to implement the management actions described in the HCP will be borne through the state-administered OHV Trust Fund (Oceano Dunes SVRA only).

The OHMVR Program, including funding for SVRA operations, receives no direct support from the state's General Fund. Instead, all funding comes from the OHV Trust Fund. Monies deposited into the OHV Trust Fund are generated by user fees associated with OHV recreation, including fuel taxes from gasoline consumed during OHV recreation on public lands, OHV registration fees, entrance fees generated at SVRAs, and Interest and miscellaneous income.

CDPR will include in its annual budget request, at a minimum, funding for the following:

- AMMs
- Monitoring of covered species
- Habitat restoration and maintenance efforts
- Predator management activities
- Law enforcement/beach patrol activities
- Public outreach and education programs
- Project administration
- Agency coordination

7.3 Funding Mechanism and Management

The State of California operates on a July 1 through June 30 fiscal year and authorizes budgets on an annual basis. Accordingly, specific monetary commitments are subject to approval through the annual process as defined by law and policy. Multi-year budgets are typically only available from outside funding sources, such as grants. CDPR cannot guarantee acceptance of grant monies unless it has received authorization from the State of California legislature to apply for and accept these funds. However, CDPR is committed to the success of this HCP and will guarantee that it will request sufficient funding from the legislature on an annual basis to properly implement the HCP and fulfill the terms and commitments of the ITP.

In the event of a changed circumstance that requires additional funds above the annual allocation, CDPR will augment fundng via discretionary reallocation of operational funds already allocated to the Oceano Dunes District. If additional funds are needed, CDPR will request discretionary reallocation of funds already allocated to the department or request a budget amendment through the Department of Finance and the state legislature.

CDPR employs permanent full-time and part-time Environmental Scientists who are qualified and responsible for organizing and implementing natural resource management activities to preserve and protect the resources within the HCP area. Oceano Dunes District Environmental Scientists, in tandem with part-time and seasonal CDPR Natural Resource staff, will organize and implement the work

necessary to fulfil the requirements of the HCP. Additionally, rangers and Maintenance staff ensure recreational use is consistent with all rules and regulations. The Environmental Scientists will consult and/or contract with qualified experts as needed to fulfill requirements under the HCP.

In conjunction with the annual monitoring report, CDPR will prepare an annual budget for the upcoming implementation year. The budget will account for CDPR's planned activities, including those related to the implementation of conservation measures expected during the upcoming year. The budget will set out projected expenditures and the funding for those expenditures. The information in the budget along with the Annual Report will contain sufficient information to demonstrate CDPR's ability to meet its financial obligations under the HCP. CDPR understands that failure to provide adequate funding and consequent failure to implement the terms of this HCP in full could result in temporary permit suspension or permit revocation.

Chapter 8. Alternatives

8.1 Summary

FESA requires that section 10 permit applicants specify in the HCP what alternative actions to the taking of federally listed species were considered and the reasons why those alternatives were not selected. The *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (USFWS and NOAA Fisheries 2016) identifies two alternatives commonly considered in HCPs: 1) an alternative that would reduce take below levels anticipated for the project and 2) a no action alternative in which no permit would be issued and take would be avoided. This section of the HCP discusses alternatives considered, including a no action alternative and a reduced take alternative. For the reasons described below these alternatives were not selected.

8.2 No Action Alternative

The No Action alternative assumes that no federal section 10(a)(1)(B) ITP will be issued to CDPR for the ongoing operations and maintenance of the park units, and existing uses in the HCP area will continue at current levels into the future. However, CDPR would continue to strive to ensure no take of state and federally listed species occurs.

Under this alternative, CDPR would continue to enforce regulations and implement AMMs to prevent take of SNPL, CLTE, SWPT, CRLF, WSF, tidewater goby, and listed plants during covered activities. In addition, as funding and resources allowed, CDPR might expand its protection of covered species (e.g., increasing monitoring). Without the ITP mandates, however, some of the funding currently used to implement the rigorous monitoring and predator management programs could be redirected to other operations and needs within the Oceano Dunes District. This could interfere with CDPR's ability to successfully implement AMMs and could reduce overall breeding success and/or leave covered species vulnerable to injury or mortality in the HCP area.

CDPR would continue to address covered species issues and implement AMMs on a case-by-case basis. However, despite the implementation of AMMs, take of covered animal species may not be avoided altogether while continuing operations. Therefore, the No Action alternative could require additional USFWS and CDPR staff time, as well as enforcement actions by the USFWS that could result in operation shutdowns and conflict with the Oceano Dunes District mandate to provide OHV and other public recreation (Public Resources Code § 5090.01 et seq.).

This action was rejected because it does not provide CDPR with the legal protection afforded by a USFWS ITP allowing continued operation of recreation activities in the HCP area.

8.3 Maintain Northern Exclosure Boundary Alternative

This alternative entails implementing the proposed HCP as described in Chapter 2, but the 6 Exclosure would not be reduced in size or eventually eliminated (part of CA-50). Thus, the existing non-climb fencing for SNPL and CLTE in the northern extent of the Southern Exclosure would continue to be erected each breeding season up to the Post 6 boundary, maintaining approximately 62 acres protected from recreation and other disturbance as well as terrestrial predators. All other covered activities would remain as described in this HCP, including new covered activities, such as capturing SNPL chicks and eggs for captive rearing if they are observed to be threatened by recreational activity (CA-12b), salvaging stranded tidewater goby (CA-13), dune slack restoration (CA-16), and eliminating the East Boneyard Exclosure (the remaining part of CA-50).

Maintaining the 6 Exclosure would avoid the uncertainty of the SNPL and CLTE response to incrementally reducing the 6 Exclosure, maintaining protected SNPL and CLTE primary habitat, while still allowing for additional recreation opportunity in the East Boneyard area, which primarily comprises secondary and tertiary habitat. Potential declines in nesting productivity and potential increases in take due to nest establishment in formerly closed areas would be avoided. Additionally, possible territorial aggression due to the loss of protected primary SNPL and CLTE habitat causing increased chick movement into the open riding area would be minimized, thus reducing additional take potential. All other impacts of this alternative on covered species would be the same as the proposed HCP.

Retaining the 6 Exclosure in its current configuration as part of the seasonally closed Southern Exclosure would avoid the potential impacts to breeding SNPL and CLTE described in sections 4.3.1.5.11 and 4.4.1.5.11.The 6 Exclosure has been the most productive nesting area of all the seasonal exclosure locations in the park. Given the productivity, the proposed HCP includes specific criteria that must be met and maintained for both SNPL and CLTE as part of reducing and eventually eliminating the 6 Exclosure (section 5.2.3). These criteria have been established to ensure the HCP area continues to contribute to species recovery while cautiously reopening some or all of the 6 Exclosure to year-round recreation.

This alternative was not selected because CDPR determined that the conservation program proposed under the HCP provides adequate measures to address the risks of reducing and eventually eliminating the 6 Exclosure. The criteria that are required to reduce the 6 Exclosure (section 5.2.3) ensure that SNPL and CLTE productivity will be maintained and take will be minimized. The area occupied by the 6 Exclosure is very popular for both motorized and non-motorized recreation, including camping. Overall, reducing or eventually eliminating the 6 Exclosure ensures CDPR can better meet the recreational needs of the public under the HCP as proposed.

8.4 Increased Patrols and/or Staffing Alternative

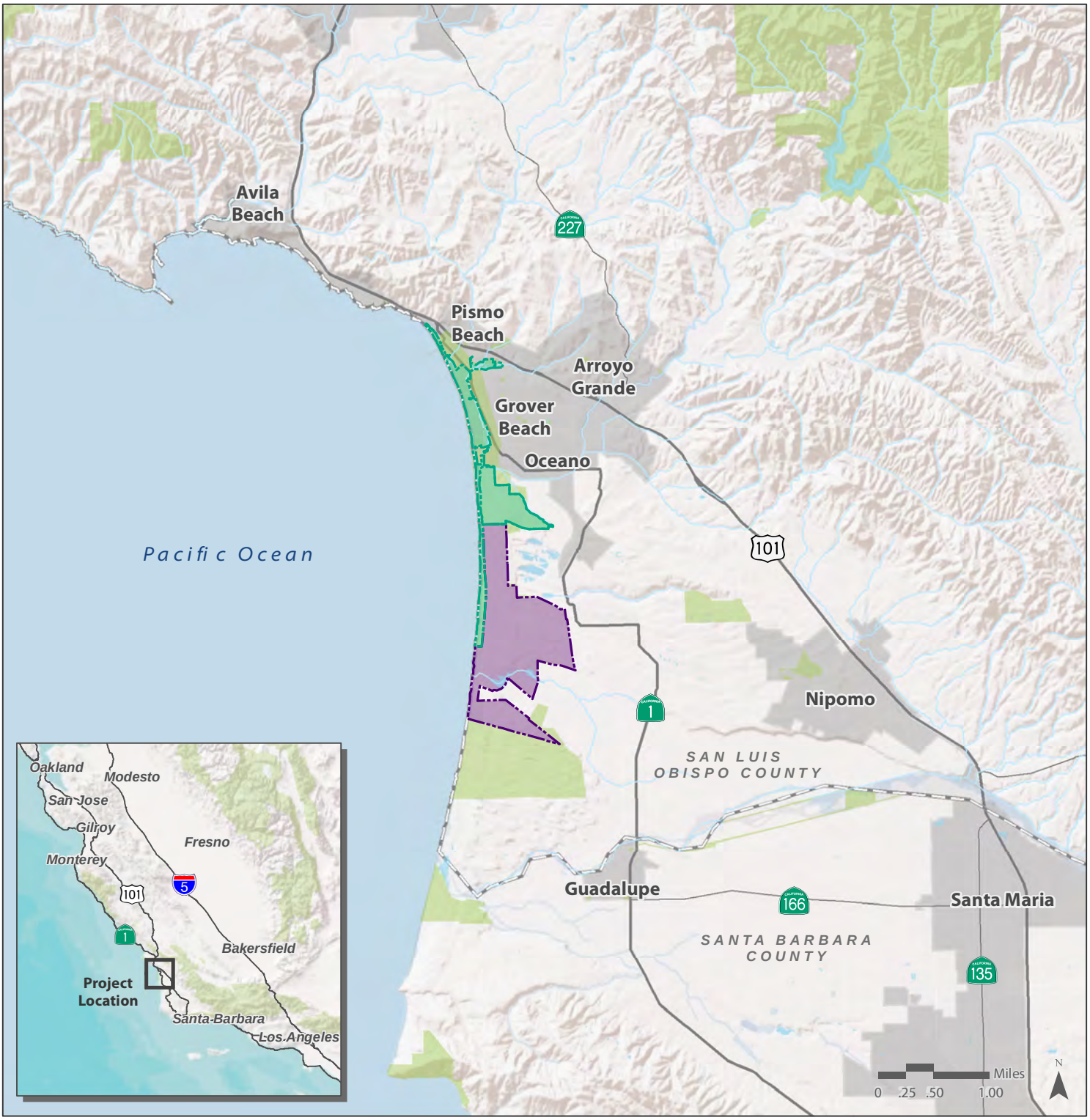
Under the increased patrols and/or staffing alternative, CDPR would implement the HCP as proposed but would also increase the number of biological staff present in the HCP area to monitor covered species and compliance with covered species regulations. CDPR would also possibly increase the number of covered species surveys and law enforcement patrols in the HCP area. In the past 20 years, CDPR has already doubled the number of biological staff present in the HCP area, which has led to an increase in frequency and time spent monitoring for covered species, including during the SNPL non-breeding season. This alternative was thus rejected because given the current staffing levels, increasing the number of staff and/or patrols adds additional cost without appreciably reducing species effects or improving outcomes.

8.5 Project-by-Project Permitting

CDPR evaluated the possibility of obtaining ITPs for individual maintenance and/or recreation activities, but rejected this alternative because of cost, staffing, and effectiveness considerations. Project-by-project permitting would require multiple permit applications, including possibly multiple HCPs. This alternative would thus require a significant amount of USFWS and CDPR staff time. It would also likely be less effective at protecting covered species than a single, comprehensive program.

Chapter 9. Maps

This page intentionally left blank.



HCP Area

- Oceano Dunes SVRA
- Pismo State Beach

Base Map Features

- Public park land
- Urban area
- County boundary
- Waterbody
- Stream
- Highway
- Major road

July 2025
Source: CDPR 2024; SLO Co Open GIS 2024; MIG 2024

Map 1 HCP Area and Vicinity

Oceano Dunes District Habitat Conservation Plan



HCP Area Boundaries

- Oceano Dunes SVRA
- Pismo State Beach

Base Map Features

- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CDPR 2024; MIG 2024

Map 2 HCP Area Overview

Oceano Dunes District Habitat Conservation Plan



Land Use & Facilities

- Campground
- Pismo State Beach Golf Course
- Corporation yard
- Street legal vehicles only
- Open to riding and camping
- Closed to motorized vehicles
- Closed to all public use
- Trail
- Oso Flaco boardwalk

- Parking
- Restrooms
- Boneyard gate
- Guiton crossing
- Air quality monitor
- OHV landmark
- Monarch butterfly grove
- Sand Highway*

Base Map Features

- Marker post
- HCP covered lands
- Boundary of Exclosures (includes shoreline)
- Waterbody
- Stream
- Highway
- Access road

Mile
0 0.5 1

N

*Approximate location

July 2025
Source: CDPR 2024; MIG 2024

Map 3 Land Use and Facilities

Oceano Dunes District Habitat Conservation Plan



Land Use & Facilities

- Campground
- Pismo State Beach Golf Course
- Corporation yard
- Street legal vehicles only
- Closed to motorized vehicles
- Trail
- Unofficial trail*
- Parking
- Guiton crossing
- Monarch butterfly grove
- Pismo Lake spillway

Base Map Features

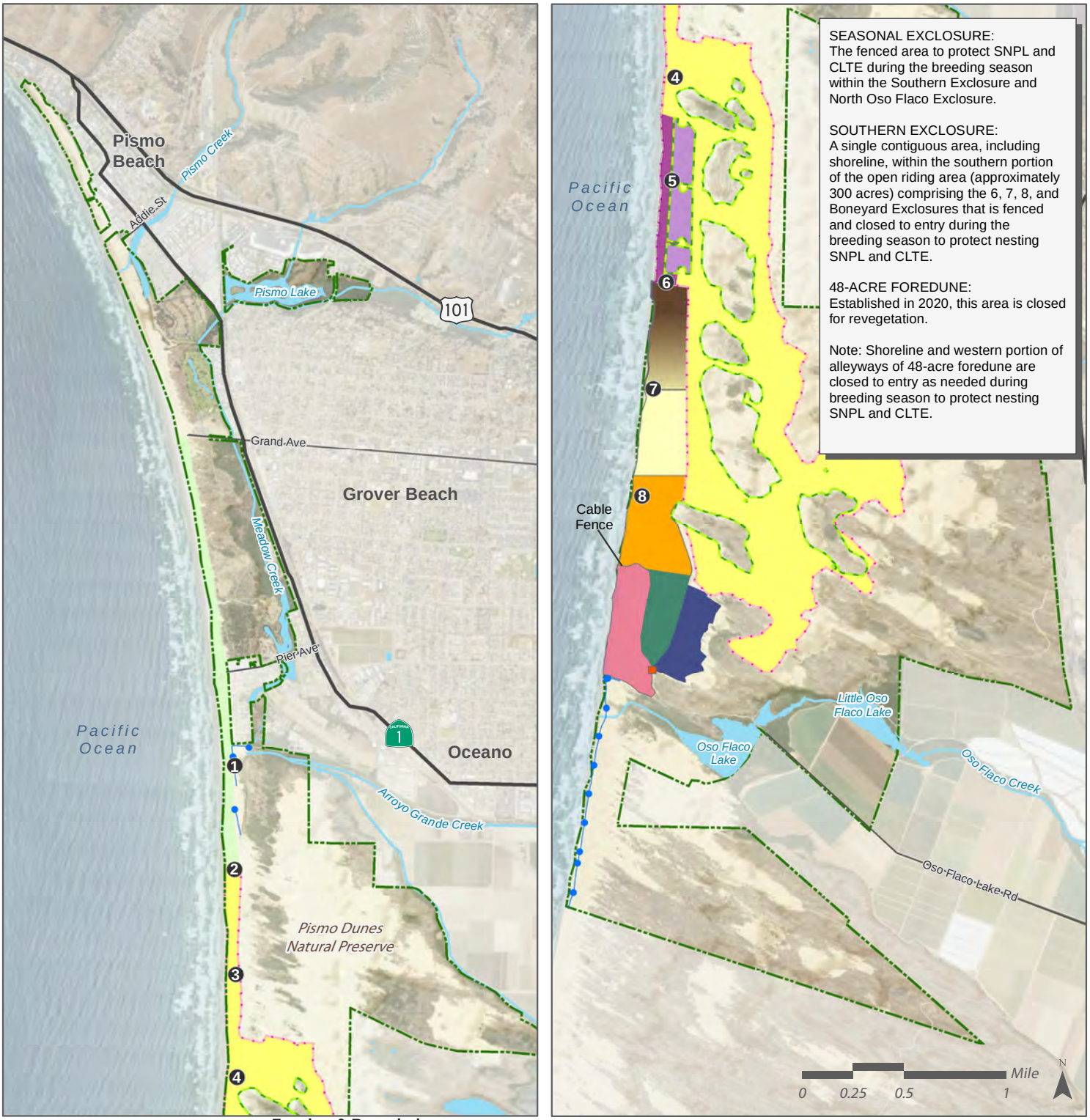
- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

*Approximate location

July 2025
Source: CDPR 2024; MIG 2024

Map 4 Land Use and Facilities Detail

Oceano Dunes District Habitat Conservation Plan



SEASONAL EXCLOSURE:
The fenced area to protect SNPL and CLTE during the breeding season within the Southern Exclosure and North Oso Flaco Exclosure.

SOUTHERN EXCLOSURE:
A single contiguous area, including shoreline, within the southern portion of the open riding area (approximately 300 acres) comprising the 6, 7, 8, and Boneyard Exclosures that is fenced and closed to entry during the breeding season to protect nesting SNPL and CLTE.

48-ACRE FOREDUNE:
Established in 2020, this area is closed for revegetation.

Note: Shoreline and western portion of alleyways of 48-acre foredune are closed to entry as needed during breeding season to protect nesting SNPL and CLTE.

Exclosures

- 6 Exclosure
- 7 Exclosure
- 8 Exclosure
- East Boneyard
- West Boneyard
- North Oso Flaco Exclosure

Fencing & Boundaries

- Vegetation island and dust control fencing
- Symbolic fence (breeding season only)
- Boneyard gate
- 48-acre foredune
- Alleyways and shoreline
- Street legal vehicles only
- Open to riding and camping

Base Map Features

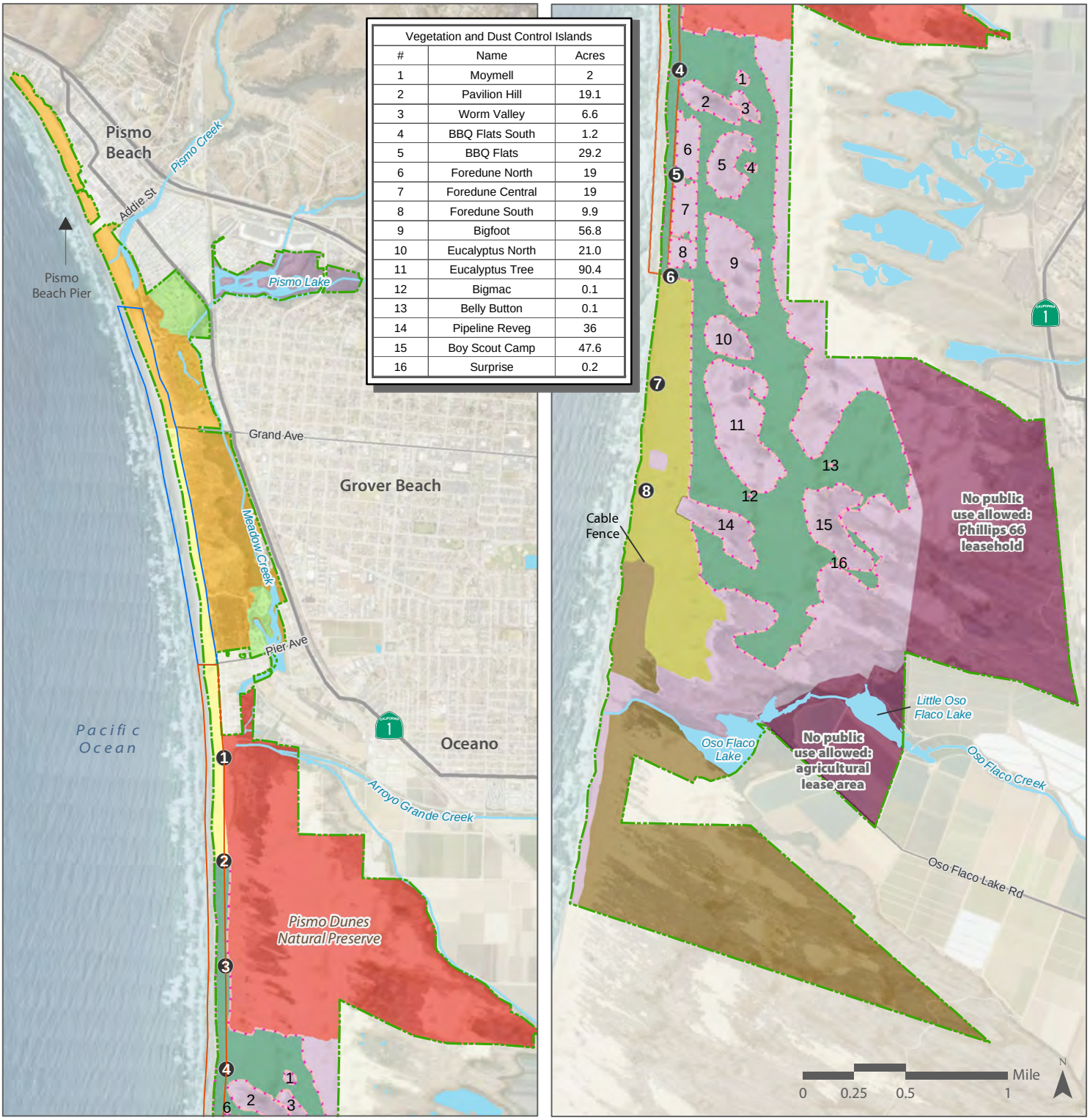
- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: CDPR 2024; MIG 2024

Map 5 Western Snowy Plover and California Least Tern Management

Oceano Dunes District Habitat Conservation Plan



Vegetation and Dust Control Islands		
#	Name	Acres
1	Moymell	2
2	Pavilion Hill	19.1
3	Worm Valley	6.6
4	BBQ Flats South	1.2
5	BBQ Flats	29.2
6	Foredune North	19
7	Foredune Central	19
8	Foredune South	9.9
9	Bigfoot	56.8
10	Eucalyptus North	21.0
11	Eucalyptus Tree	90.4
12	Bigmac	0.1
13	Belly Button	0.1
14	Pipeline Reveg	36
15	Boy Scout Camp	47.6
16	Surprise	0.2

Recreational Restrictions

- No public use allowed
- Horses allowed - closed to dogs, vehicles, and
- Dogs and horses allowed - closed to vehicles and camping
- Dogs, horses, and street-legal vehicles allowed, closed to OHV riding and camping
- Developed campground, dogs allowed
- Open to OHV riding, camping, dogs, and horses
- Pedestrians only - no vehicles, dogs, horses, or
- Seasonally open to dogs, horses, camping, and OHV riding from Oct 1-Feb 29
- Seasonally open to pedestrians only from Oct 1-Feb
- Year-round open riding

Kiteboarding landing/launching

- Wet/dry allowed
- Wet only

Base Map Features

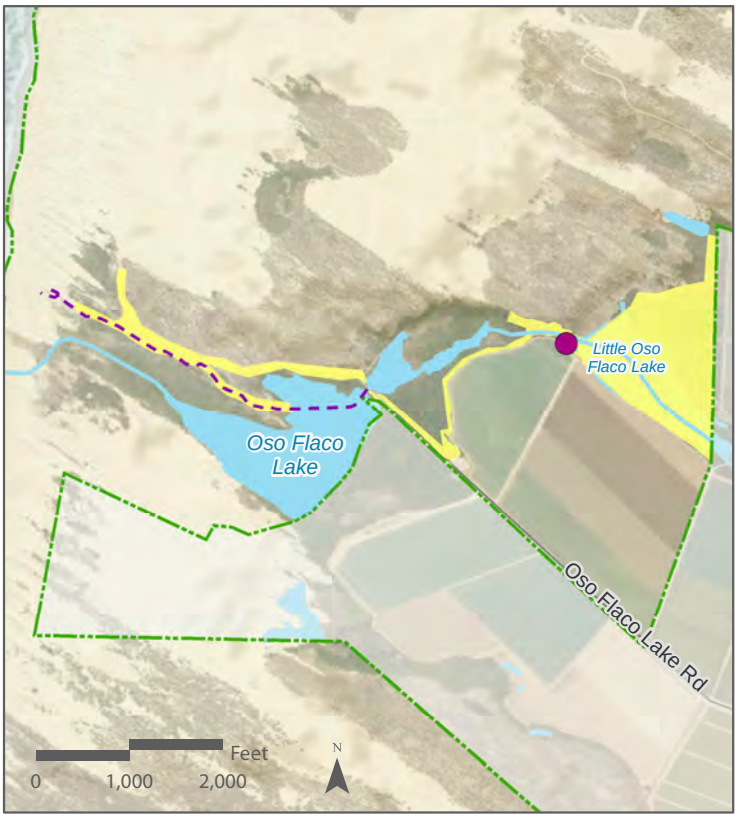
- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

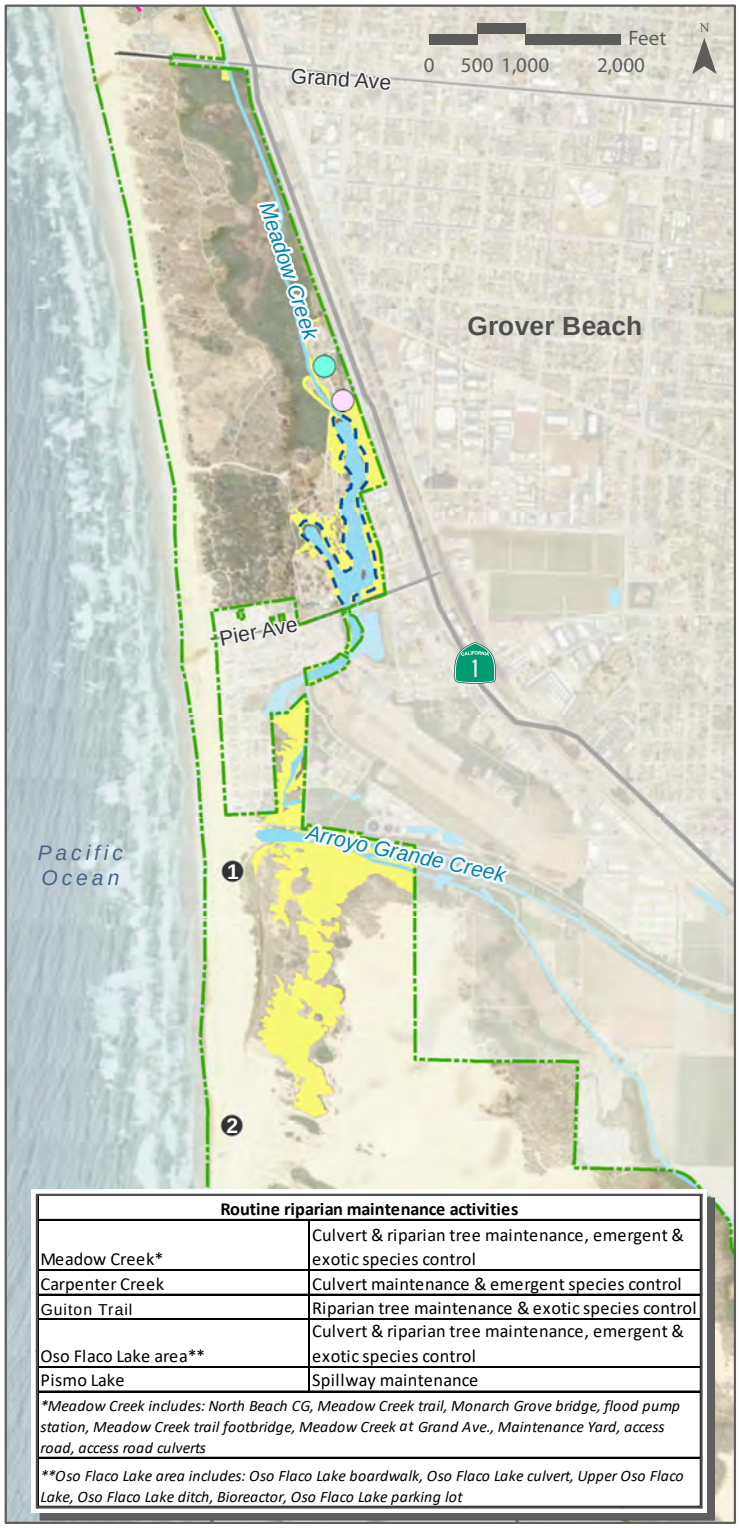
July 2025
Source: CDPR 2024; MIG 2024

Map 6 Recreational Restrictions

Oceano Dunes District Habitat Conservation Plan







Routine riparian maintenance activities	
Meadow Creek*	Culvert & riparian tree maintenance, emergent & exotic species control
Carpenter Creek	Culvert maintenance & emergent species control
Guiton Trail	Riparian tree maintenance & exotic species control
Oso Flaco Lake area**	Culvert & riparian tree maintenance, emergent & exotic species control
Pismo Lake	Spillway maintenance
**Meadow Creek includes: North Beach CG, Meadow Creek trail, Monarch Grove bridge, flood pump station, Meadow Creek trail footbridge, Meadow Creek at Grand Ave., Maintenance Yard, access road, access road culverts*	
***Oso Flaco Lake area includes: Oso Flaco Lake boardwalk, Oso Flaco Lake culvert, Upper Oso Flaco Lake, Oso Flaco Lake ditch, Bioreactor, Oso Flaco Lake parking lot*	

Riparian Maintenance Locations

- Potential future riparian vegetation maintenance area
- Carpenter Creek
- Access road
- Corporation Yard
- Oso Flaco Creek bioreactor
- Pismo Lake spillway

Trails

- Oso Flaco Boardwalk Trail
- Beach Boardwalk
- Guiton Trail

Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: CDPR 2024; MIG 2024

Map 7 Riparian Maintenance Locations

Oceano Dunes District Habitat Conservation Plan



Covered Activities

- CA-16 Habitat restoration program – CalVTP
- CA-21 Mechanical trash removal*
- CA-28 Cable fence replacement
- CA-38 Grover Beach Lodge
- CA-41 Pismo Creek Estuary bridge options
- CA-42 Limited trail riding area
- CA-16 Dune slack restoration*
- CA-43 Safety & Education Center replacement
- CA-44 Track-out device
- CA-44 Supp. foredune maintenance
- CA-48 Oso Flaco Lake boardwalk replacement
- CA-50 6 Exclosure reduction*
- CA-50 Boneyard Exclosure reduction

*Approximate location

Base Map Features

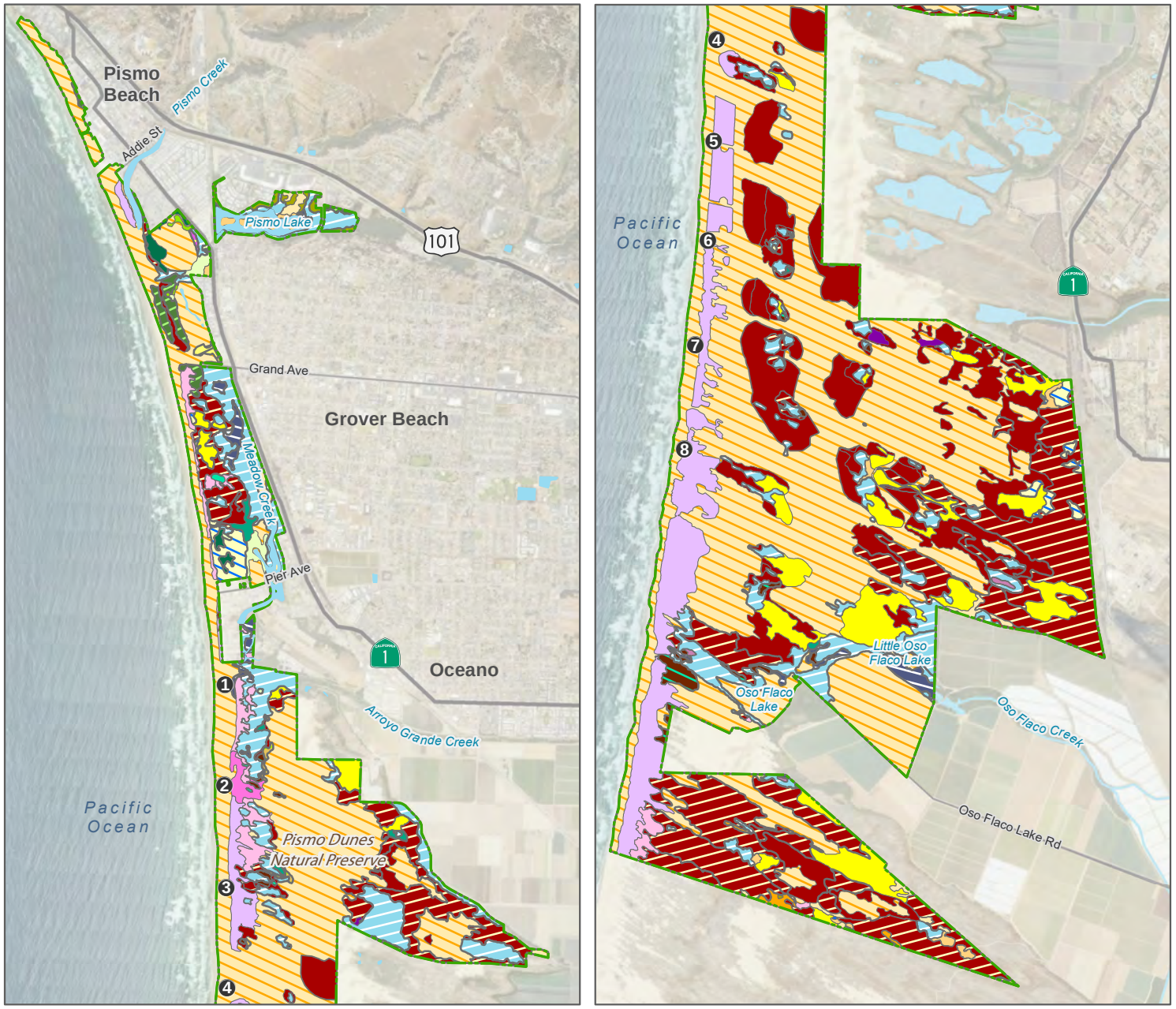
- Marker post
- Boundary of Exclosures (includes shoreline)
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: CDPR 2024; MIG 2024

Map 8 Covered Activities Modifying Existing Operations and Facilities

Oceano Dunes District Habitat Conservation Plan



Vegetation and Landcover Types

Herblands and Grasslands

- *Abronia latifolia – Ambrosia chamissonis* Alliance
- *Ammophila arenaria* Semi-Natural Alliance
- *Cakile (edentula, maritima)* Provisional Semi-Natural Alliance
- Californian Annual Grassland and Forb Meadow
- Californian Ruderal Grassland, Meadow, and Scrub
- *Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Alliance
- *Juncus lescurii* Association
- *Mesembryanthemum* spp. – *Carpobrotus* spp. Semi-Natural Alliance
- *Sarcocornia pacifica (Salicornia depressa)* Alliance
- *Schoenoplectus (acutus, californicus)* Alliance
- *Typha (angustifolia, domingensis, latifolia)* Alliance

Shrublands

- *Acacia (cyclops, dealbata)* Association
- *Baccharis pilularis* Alliance
- *Coreopsis gigantea* Alliance
- *Ericameria ericoides* Association
- *Frangula californica* ssp. *californica* Provisional Association
- *Lupinus chamissonis* Association
- *Lupinus chamissonis – Ericameria ericoides* Alliance
- *Rubus spectabilis – Morella californica* Alliance
- *Rubus ursinus* Association
- *Salix lasiolepis* Alliance
- *Toxicodendron diversilobum* Alliance

Forest and Woodlands

- *Eucalyptus (globulus, camaldulensis)* Semi-Natural Association
- *Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana)* Alliance
- *Hesperocyparis macrocarpa – Pinus radiata* Semi-Natural Alliance
- *Pinus muricata – Pinus radiata* Alliance
- *Populus trichocarpa* Alliance
- *Quercus agrifolia* Alliance

Other Landcover

- Sand
- Agriculture
- Urban

Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CDPR 202; MIG 2024

Map 9 Vegetation Types

Oceano Dunes District Habitat Conservation Plan



Western Snowy Plover Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat
- SNPL critical habitat - CA 31
- SNPL recovery plan unit - CA 83

Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

0 0.25 0.5 1 Mile

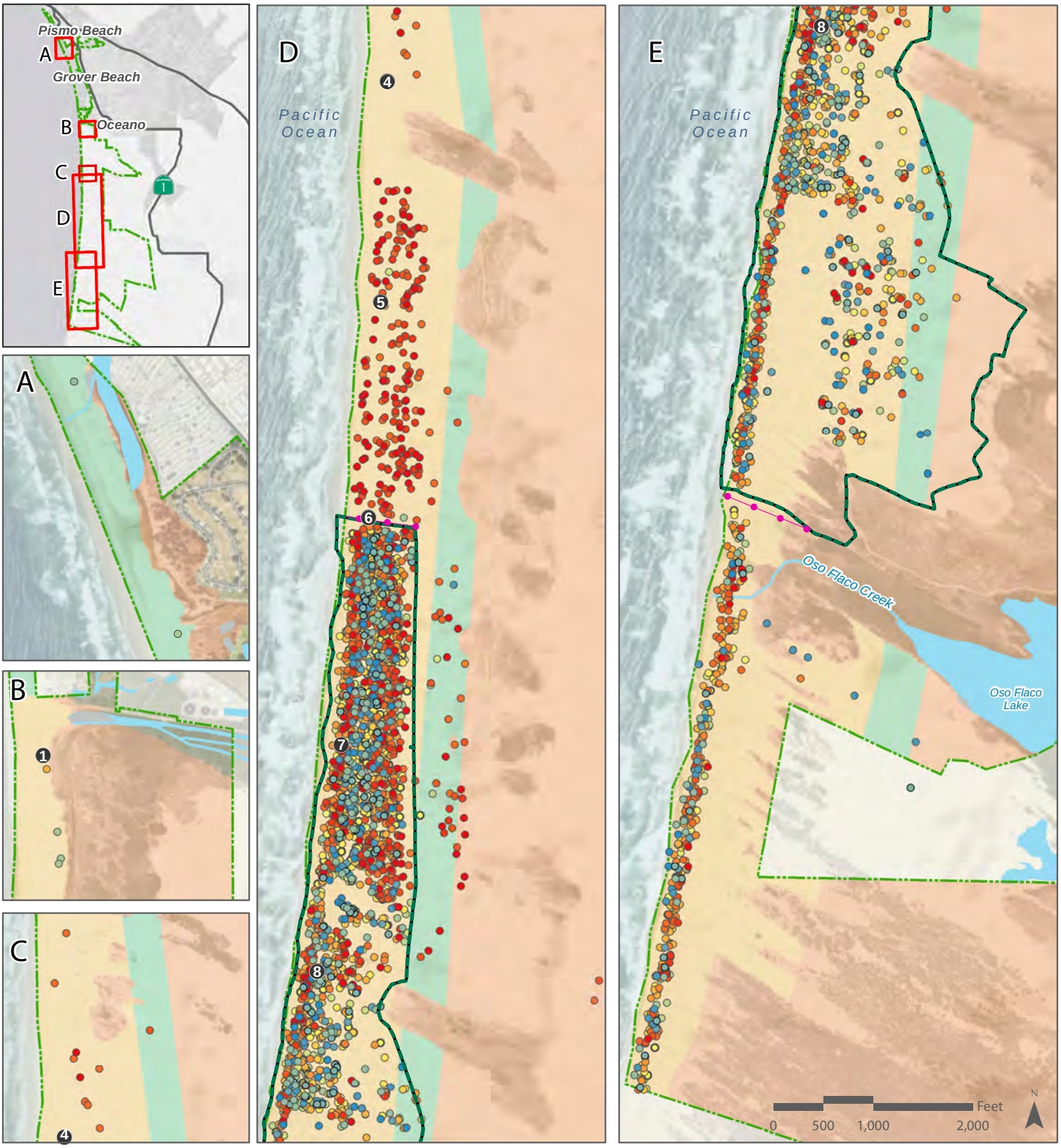
N

MIG

July 2025
Source: CDPR 2024; MIG 2024

Map 10 Western Snowy Plover Breeding Habitat, Critical Habitat Unit, and Recovery Unit

Oceano Dunes District Habitat Conservation Plan



Snowy Plover Nest Locations

2005

2023

Snowy Plover Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat

Base Map Features

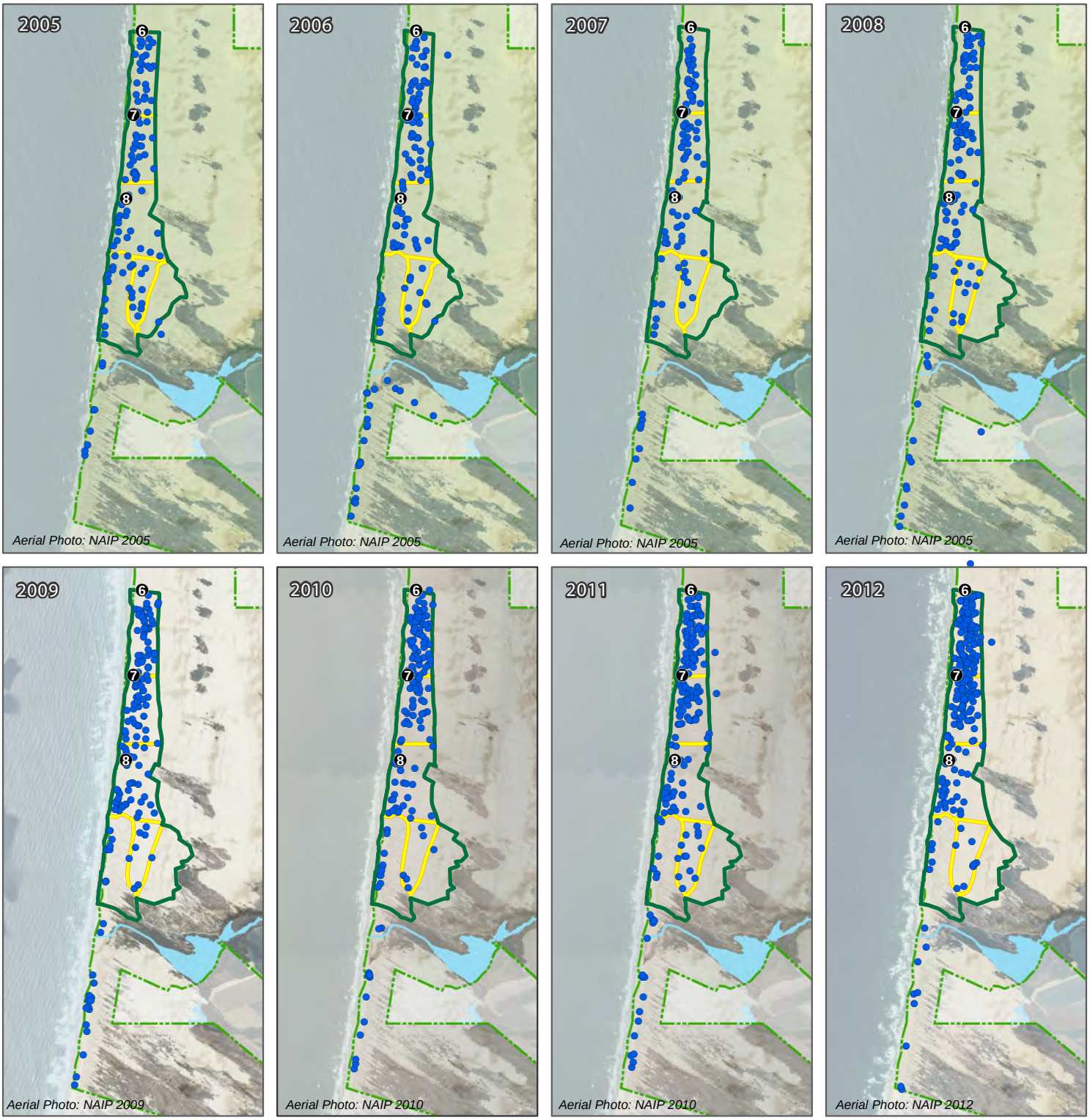
- Marker post
- HCP covered lands
- Boundary of Exclosures
- Symbolically closed shoreline
- Waterbody
- Stream
- Highway

July 2025

Source: CDPR 2024; MIG 2024

Map 11a Western Snowy Plover Nesting Locations (2005-2023)

Oceano Dunes District Habitat Conservation Plan



Snowy Plover Nest Locations

- Nest location

Base Map Features

- Marker post
- HCP covered lands
- Non-fenced Exclosure boundary
- Boundary of Exclosures (includes shoreline)
- Waterbody
- Stream

0 0.5 1 Miles

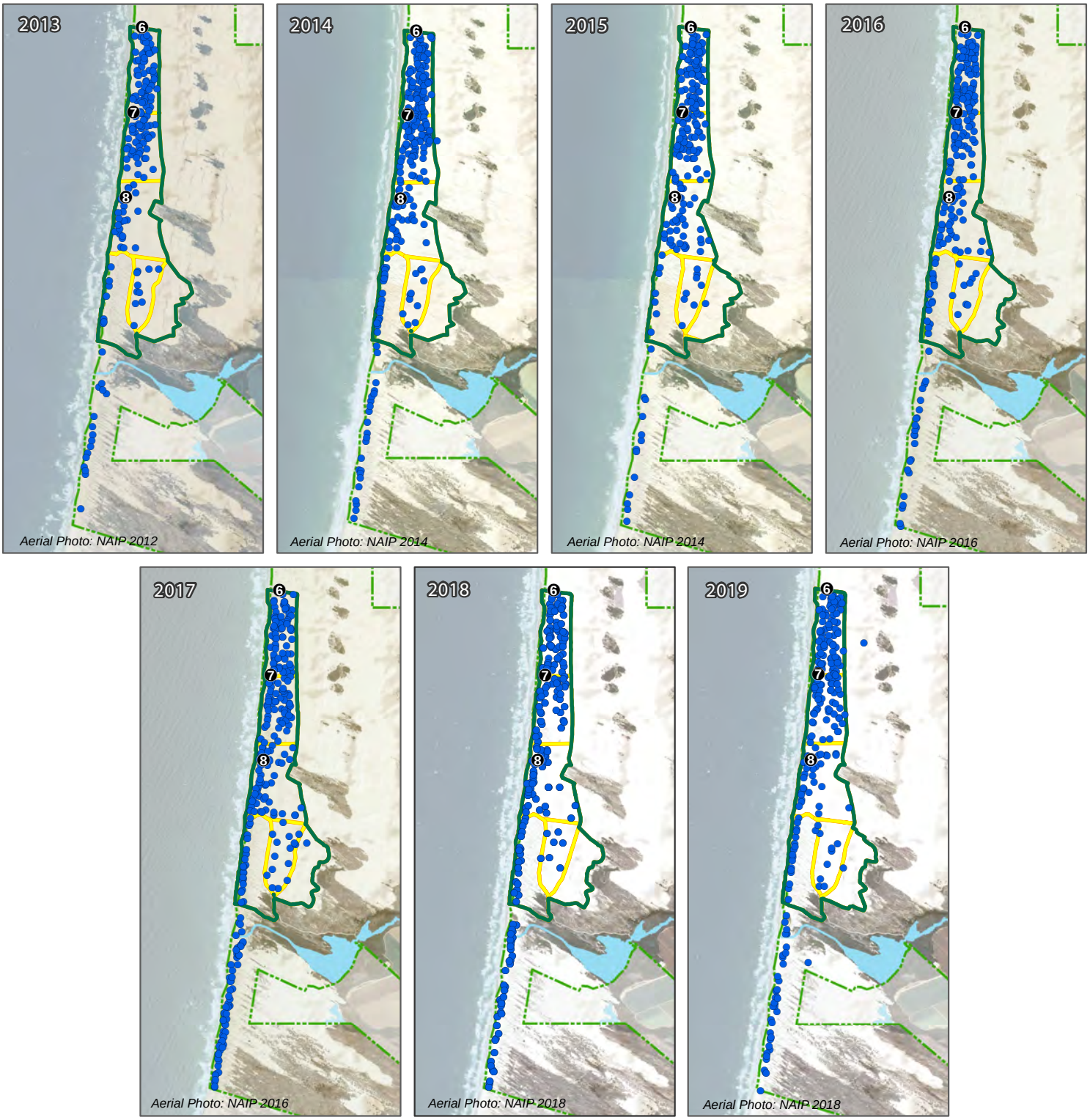
N

July 2025

Source: CDPR 2024; MIG 2024

Map 11b Western Snowy Plover Nesting Locations (2005-2012)

Oceano Dunes District Habitat Conservation Plan



Snowy Plover Nest Locations

- Nest location

Base Map Features

- Marker post
- HCP covered lands
- Non-fenced Exclosure boundary
- Boundary of Exclosures (includes shoreline)
- Waterbody
- Stream

0 0.5 1 Miles

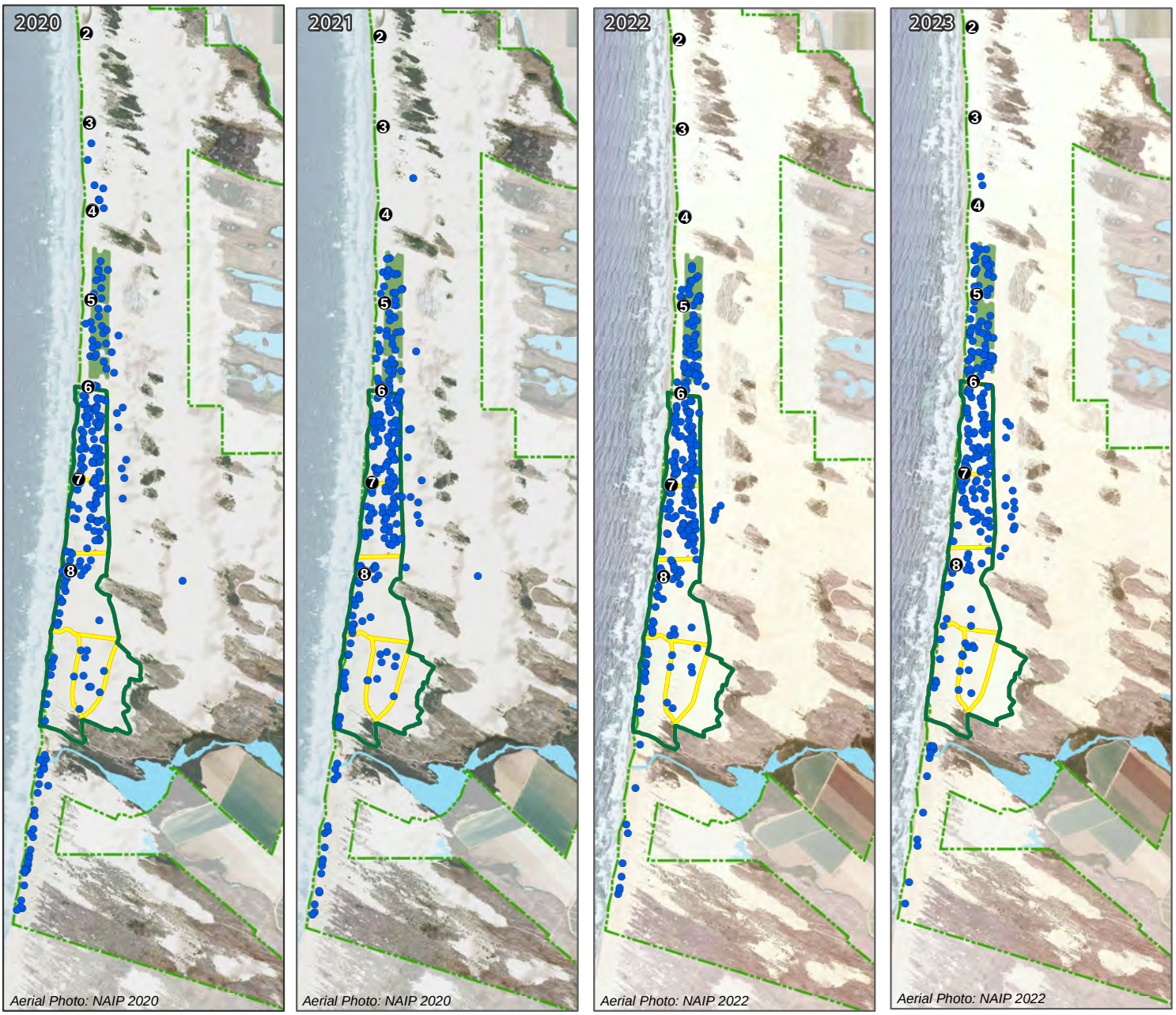
N

July 2025

Source: CDPR 2024; MIG 2024

Map 11c Western Snowy Plover Nesting Locations (2013-2019)

Oceano Dunes District Habitat Conservation Plan



Snowy Plover Nest Locations

- Nest location

Base Map Features

- Marker post
- HCP covered lands
- 48-acre foredune
- Non-fenced Exclosure boundary
- Boundary of Exclosures (includes shoreline)
- Waterbody
- Stream

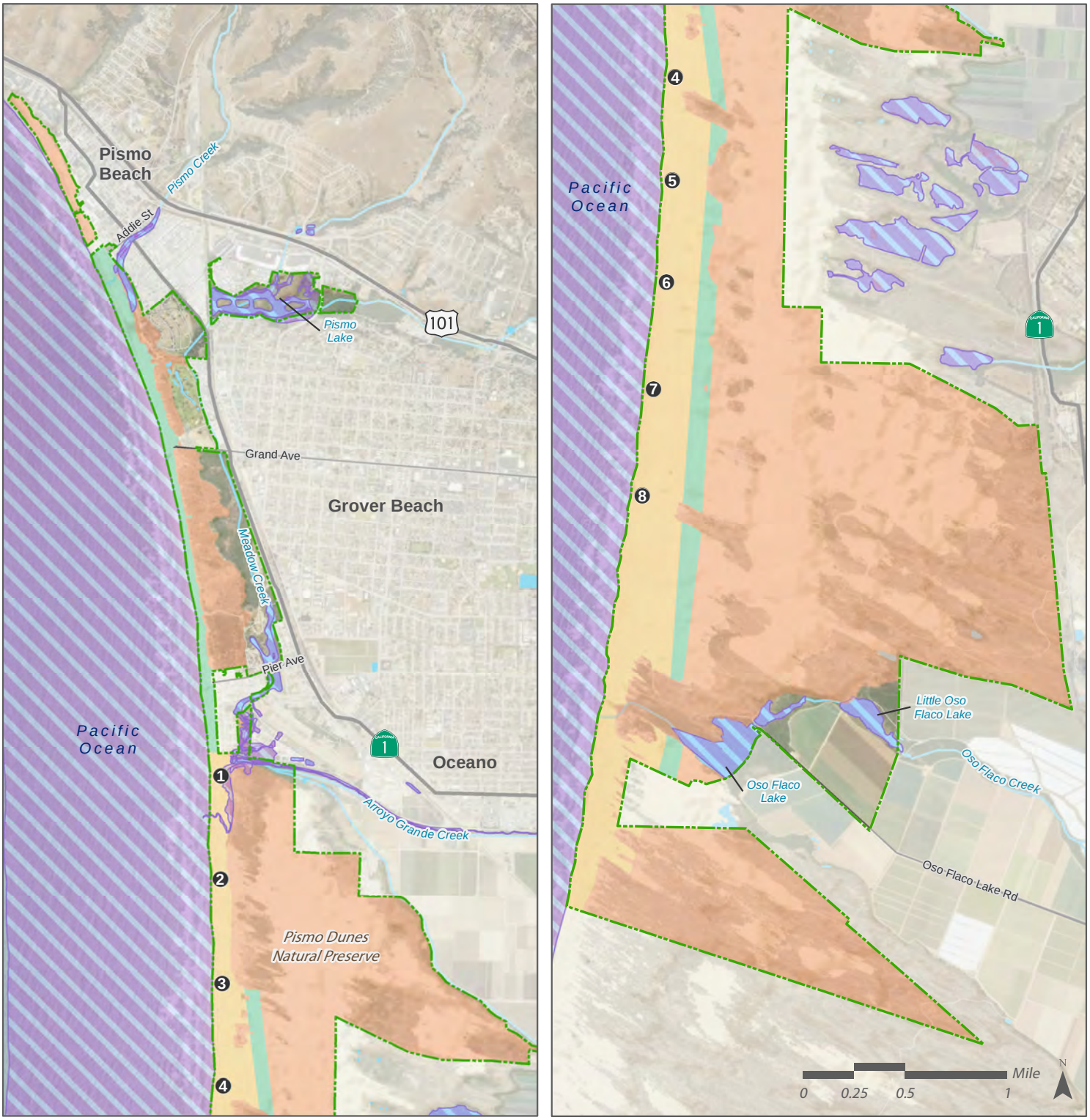
0 0.25 0.5 1 Mile

N

July 2025
Source: CDPR, 2024; MIG, 2024

Map 11d Western Snowy Plover Nesting Locations (2020-2023)

Oceano Dunes District Habitat Conservation Plan



California Least Tern Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat
- Foraging habitat

Base Map Features

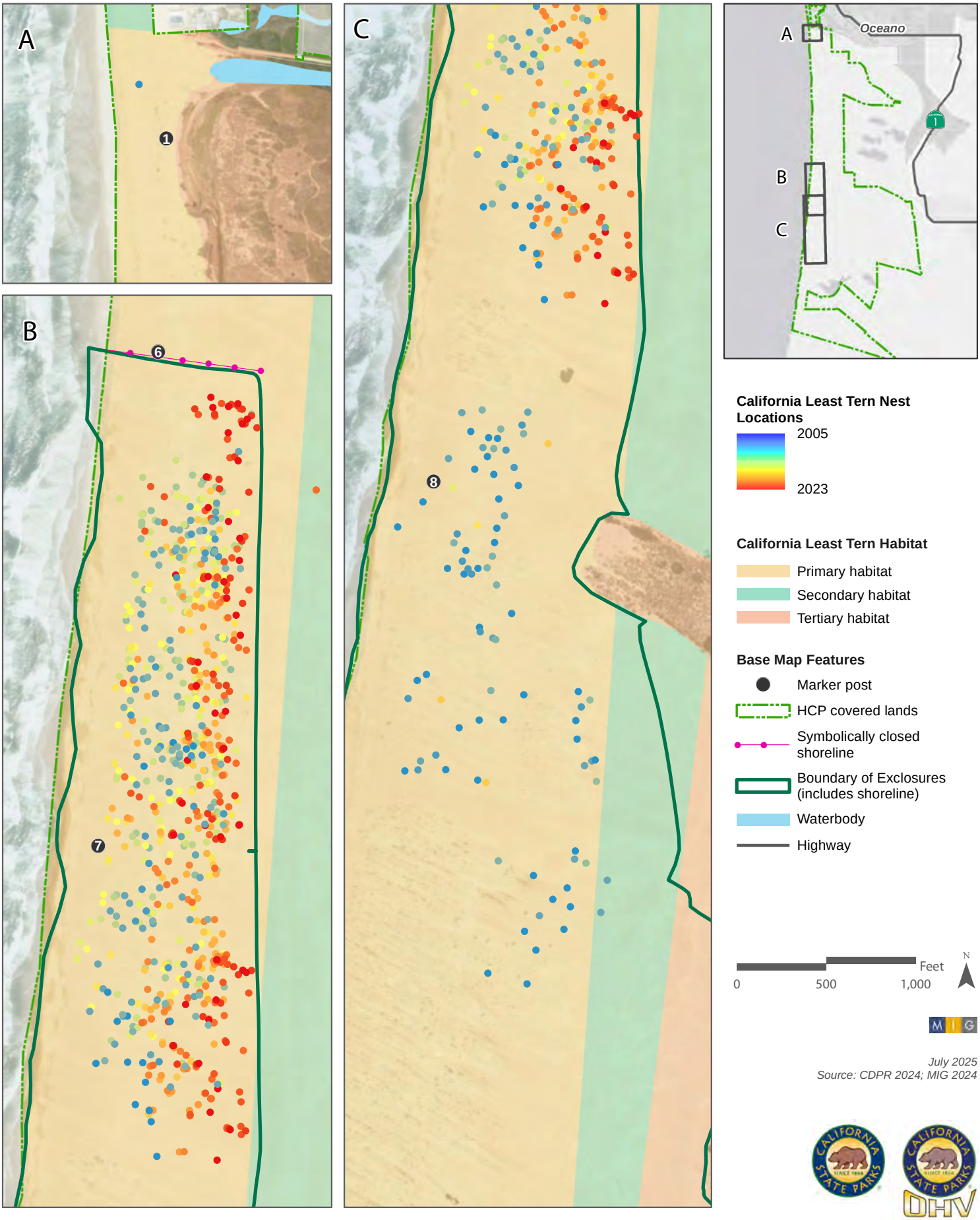
- Marker post
- HCP Covered Lands
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: CDPR 2024; MIG 2024

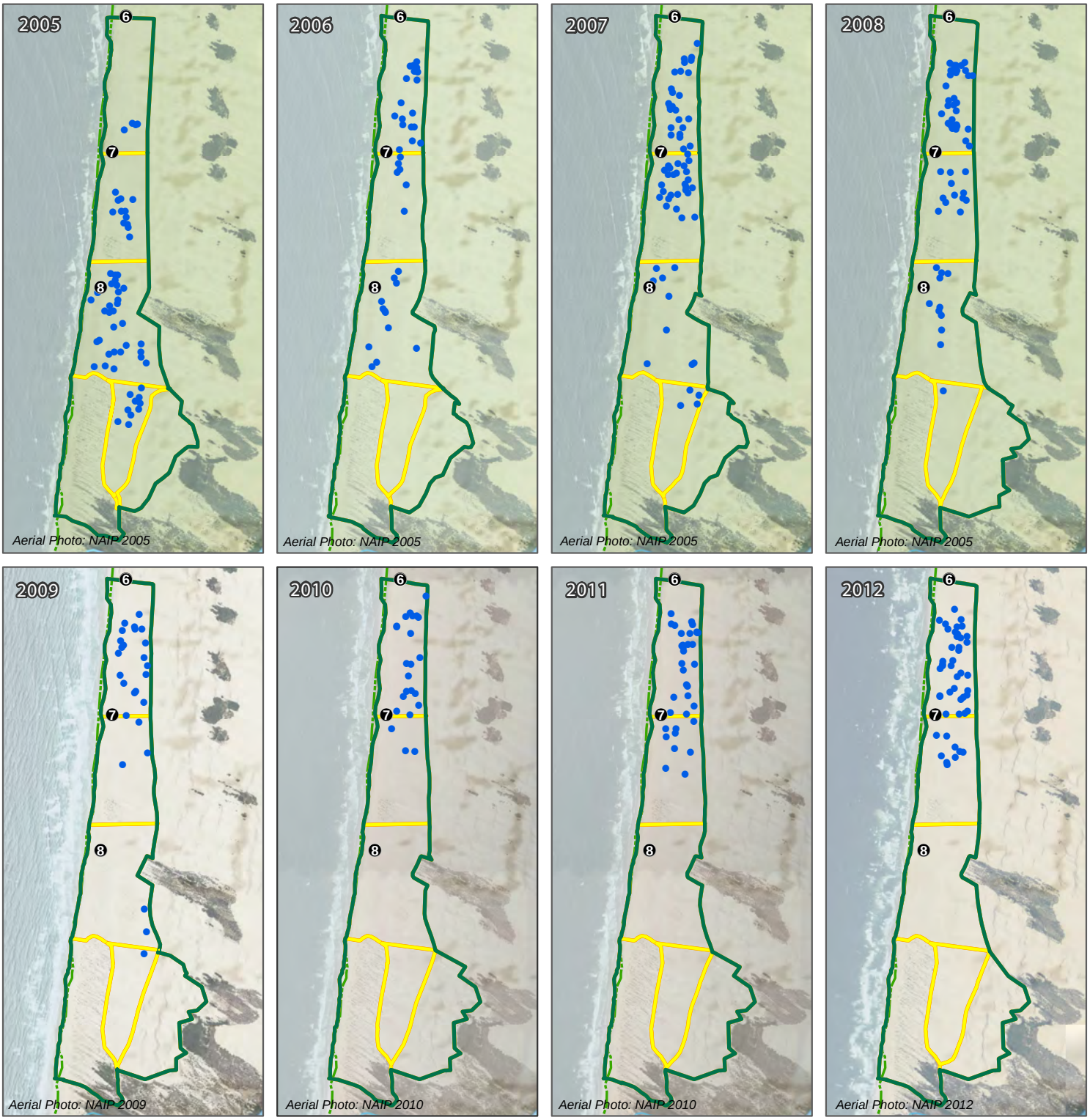
Map 12 California Least Tern Breeding and Foraging Habitat

Oceano Dunes District Habitat Conservation Plan



Map 13a California Least Tern Nesting Locations (2005-2023)

Oceano Dunes District Habitat Conservation Plan



California Least Tern Nest Locations

- Nest Location

Base Map Features

- Marker post
- HCP covered lands
- Boundary of Exclosures (includes shoreline)
- Non-fenced Exclosure boundary

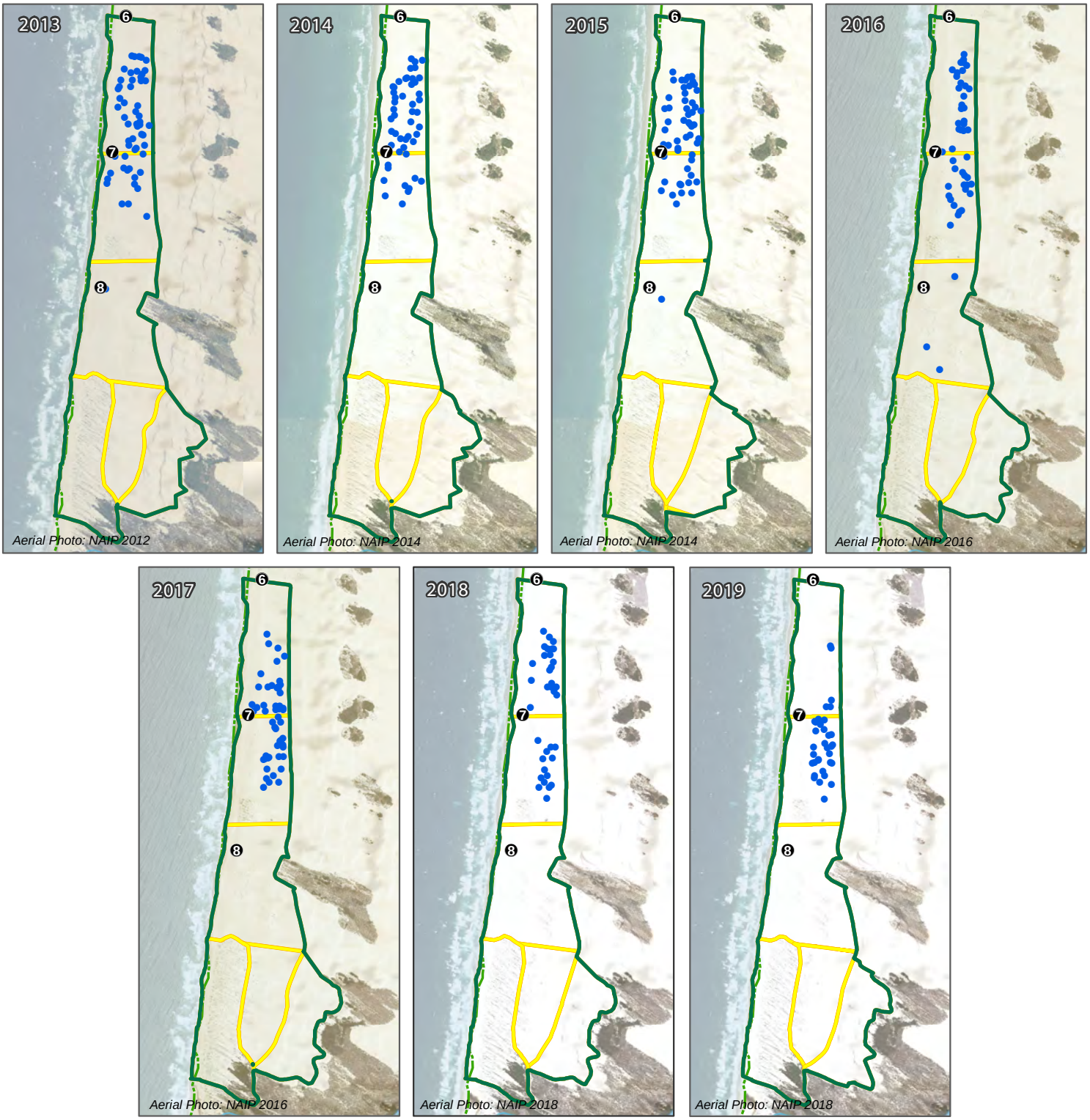
Mile
0 0.25 0.5

N

July 2025
Source: CDPR 2024; MIG 2024

Map 13b California Least Tern Nesting Locations (2005-2012)

Oceano Dunes District Habitat Conservation Plan



California Least Tern Nest Locations

- Nest Location

Base Map Features

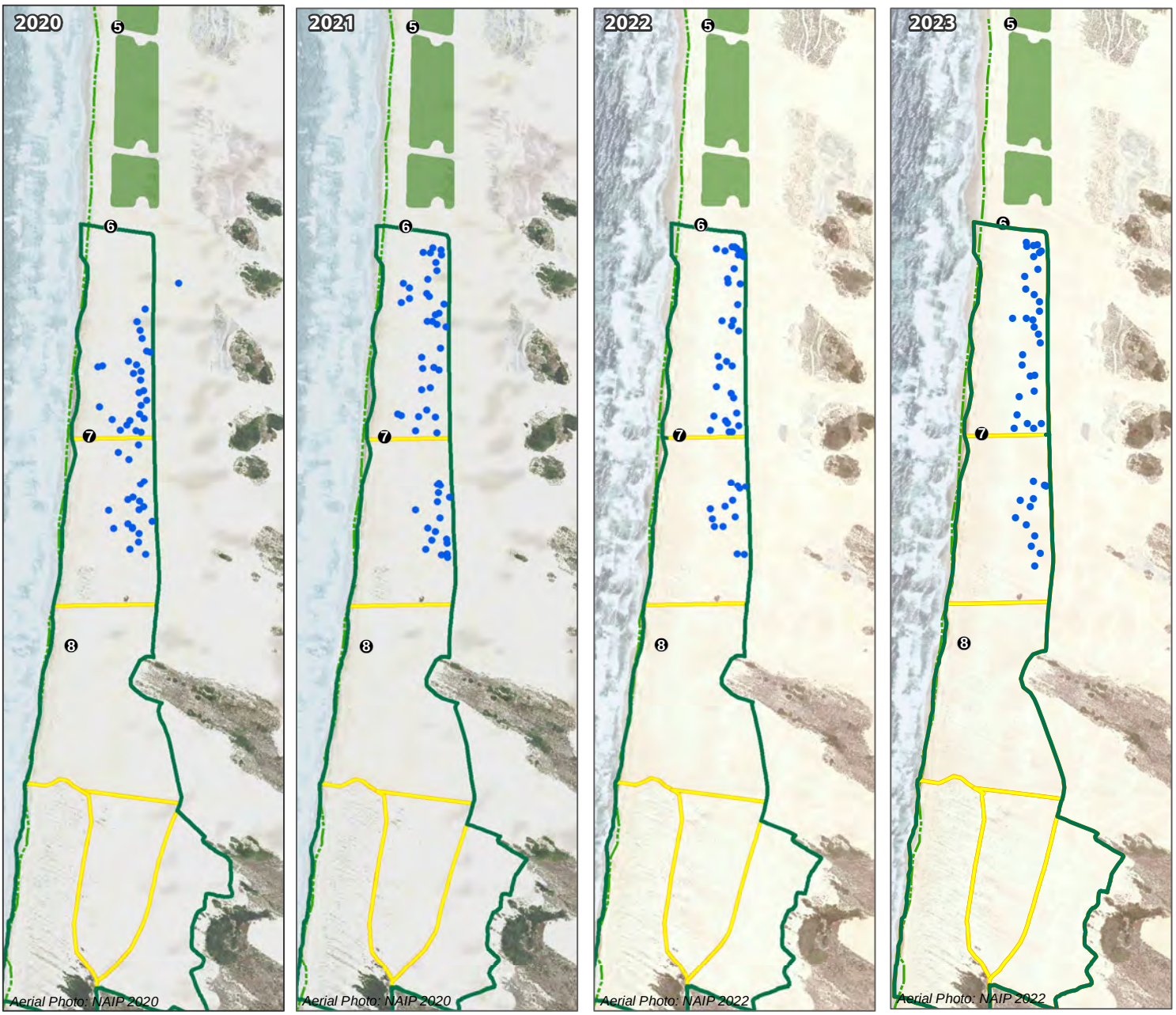
- Marker post
- HCP covered lands
- Boundary of Exclosures (includes shoreline)
- Non-fenced Exclosure boundary

Miles
0 0.25 0.5
N

July 2025
Source: CDPR 2024; MIG 2024

Map 13c California Least Tern Nesting Locations (2013-2019)

Oceano Dunes District Habitat Conservation Plan



California Least Tern Nest Locations

- Nest Location

Base Map Features

- Marker post
- HCP covered lands
- 48-acre foredune
- Boundary of Exclosures (includes shoreline)
- Non-fenced Exclosure boundary

Miles
0 0.25 0.5

N

MIG

July 2025
Source: CDPR 2024; MIG 2024

Map 13d California Least Tern Nesting Locations (2020-2023)

Oceano Dunes District Habitat Conservation Plan



Southwestern Pond Turtle Habitat

- SWPT occurrences - iNaturalist (Research Grade and Verified) and CDPR incidental reports
- SWPT occurrences - CNDDB
- Potential SWPT aquatic habitat - USFWS National Wetland Inventory
- Potential SWPT breeding habitat - 500m distance from aquatic habitat

Base Map Features

- HCP covered lands
- Marker post
- Waterbody
- Stream
- Highway
- Access road

Note: SWPT upland habitat is located throughout the HCP area wherever not mapped as potential aquatic or breeding habitat.

July 2025
Source: USFWS 2024; CDPR 2024; MIG 2024

Map 14a Southwestern Pond Turtle Occurrences and Potential Habitat

Oceano Dunes District Habitat Conservation Plan



Southwestern Pond Turtle Habitat

- SWPT occurrences - iNaturalist (Research Grade and Verified) and CDPR incidental reports
- SWPT occurrences - CNDDB
- Potential SWPT aquatic habitat - USFWS National Wetland Inventory
- Potential SWPT breeding habitat - 500m distance from aquatic habitat

Base Map Features

- HCP covered lands
- Marker post
- Waterbody
- Stream
- Highway
- Access road
- Campground

Note: SWPT upland habitat is located throughout the HCP area wherever not mapped as potential aquatic or breeding habitat.

MIG

July 2025
Source: USFWS 2024; CDPR 2024; MIG 2024

Map 14b Southwestern Pond Turtle Occurrences and Potential Habitat, Focused on Developed Camping Sites within HCP Area



California Red-legged Frog Habitat

- CRLF occurrence - survey data
- Potential CRLF breeding habitat - USFWS National Wetland Inventory
- CRLF recovery plan unit - core area 23

Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

Note: CRLF upland habitat is located throughout the HCP area wherever wetlands are absent. Wetland habitat includes: riverine, lake, freshwater pond, freshwater emergent, and estuarine wetlands.

MIG

July 2025
Source: USFWS 2024; CDPR 2024; MIG 2024

Map 15 California Red-legged Frog Occurrences, Potential Habitat, and Recovery Plan Unit

Oceano Dunes District Habitat Conservation Plan



Western Spadefoot Habitat

- WSF occurrence - CDPR
- Potential WSF breeding habitat - USFWS National Wetland Inventory

Base Map Features

- HCP covered lands
- Marker post
- Waterbody
- Stream
- Highway
- Access road

Note: WSF upland habitat is located throughout the HCP area wherever wetlands are absent. Wetland habitat includes: riverine, lake, freshwater pond, freshwater emergent, and estuarine wetlands.

MIG

July 2025
Source: USFWS 2024; CDPR 2024; MIG 2024

Map 16 Western Spadefoot Occurrences and Potential Habitat

Oceano Dunes District Habitat Conservation Plan



Tidewater Goby Habitat

- Tidewater goby critical habitat
- Tidewater goby occupied habitat

Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: USFWS 2024; CDPR 2024; MIG 2024

Map 17 Tidewater Goby Habitat and Critical Habitat

Oceano Dunes District Habitat Conservation Plan



Sensitive Plant Habitat

- Marsh sandwort / Gambel's watercress: 16 acres
- La Graciosa thistle: 559 acres
- Surf thistle / Beach spectaclepod: 896 acres
- Nipomo Mesa lupine: 267 acres

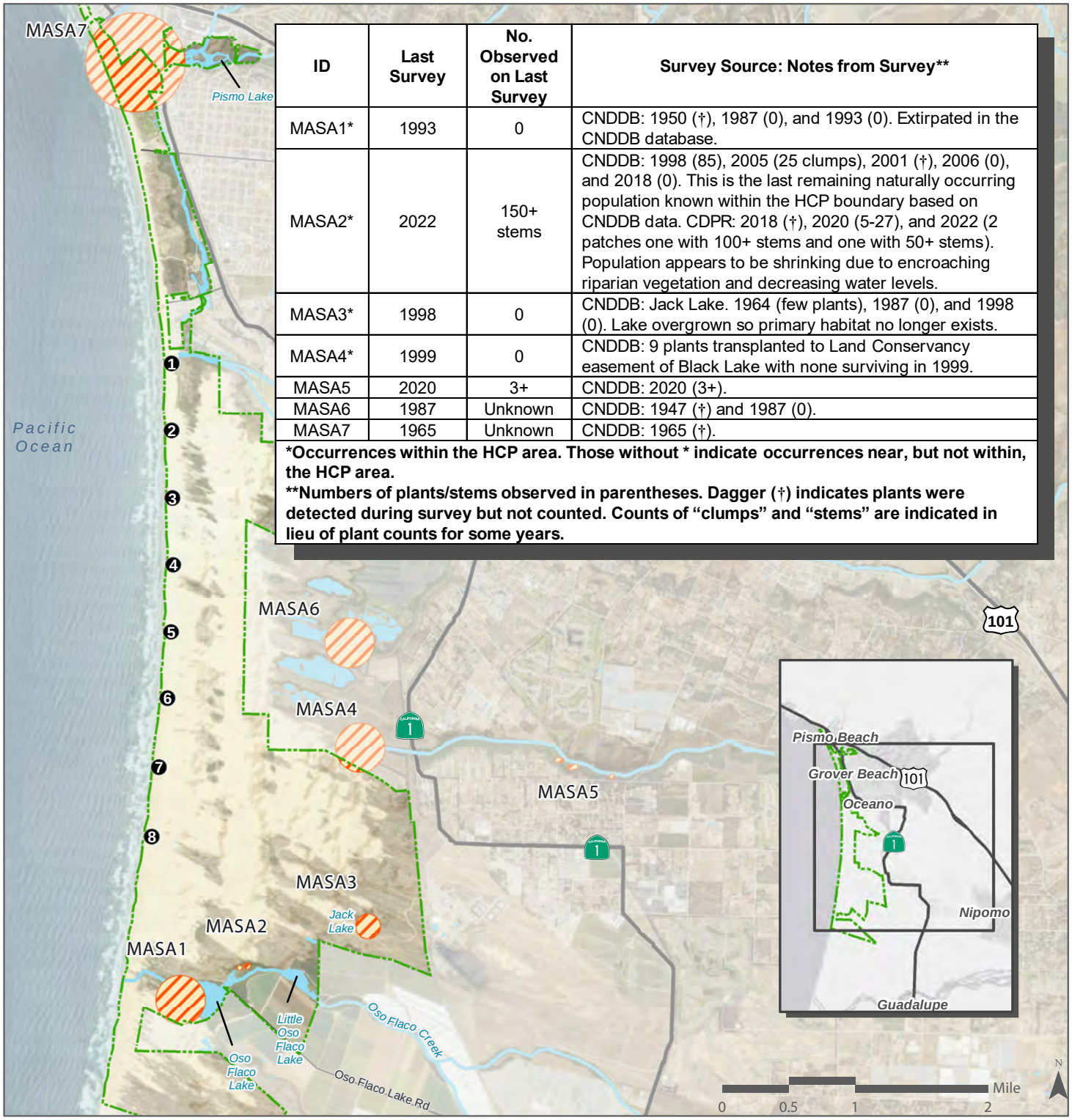
Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CDPR 2024; MIG 2024

Map 18 Modeled Plant Habitat in the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last Survey	No. Observed on Last Survey	Survey Source: Notes from Survey**
MASA1*	1993	0	CNDDB: 1950 (†), 1987 (0), and 1993 (0). Extirpated in the CNDDB database.
MASA2*	2022	150+ stems	CNDDB: 1998 (85), 2005 (25 clumps), 2001 (†), 2006 (0), and 2018 (0). This is the last remaining naturally occurring population known within the HCP boundary based on CNDDB data. CDPR: 2018 (†), 2020 (5-27), and 2022 (2 patches one with 100+ stems and one with 50+ stems). Population appears to be shrinking due to encroaching riparian vegetation and decreasing water levels.
MASA3*	1998	0	CNDDB: Jack Lake. 1964 (few plants), 1987 (0), and 1998 (0). Lake overgrown so primary habitat no longer exists.
MASA4*	1999	0	CNDDB: 9 plants transplanted to Land Conservancy easement of Black Lake with none surviving in 1999.
MASA5	2020	3+	CNDDB: 2020 (3+).
MASA6	1987	Unknown	CNDDB: 1947 (†) and 1987 (0).
MASA7	1965	Unknown	CNDDB: 1965 (†).

***Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.**
****Numbers of plants/stems observed in parentheses. Dagger (†) indicates plants were detected during survey but not counted. Counts of "clumps" and "stems" are indicated in lieu of plant counts for some years.**

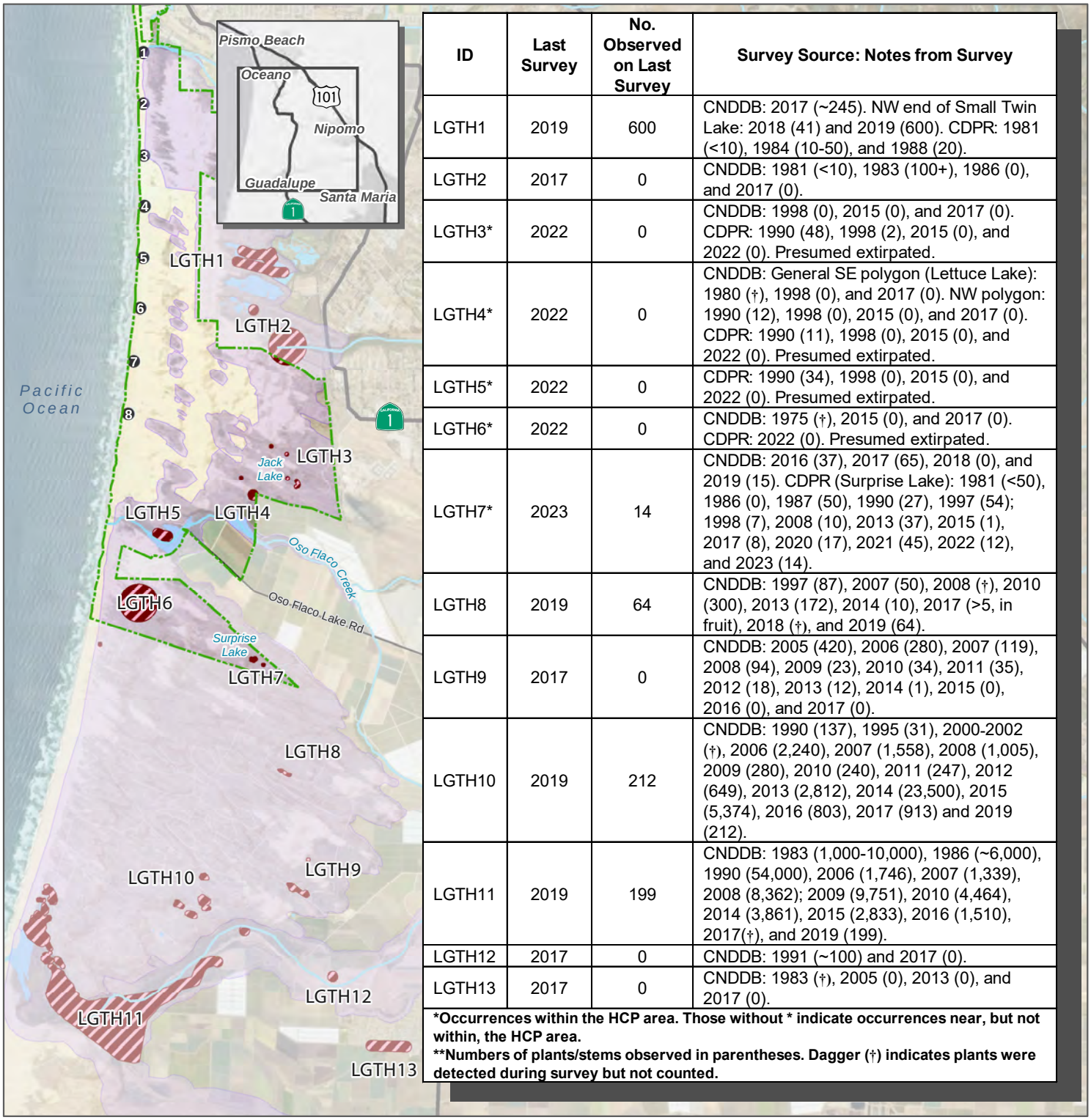
Marsh Sandwort
- Marsh sandwort occurrences

Base Map Features
- HCP Covered Lands
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CNDDB 2024; CDPR 2024; MIG 2024

Map 19 Marsh Sandwort Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last Survey	No. Observed on Last Survey	Survey Source: Notes from Survey
LGTH1	2019	600	CNDDB: 2017 (~245). NW end of Small Twin Lake: 2018 (41) and 2019 (600). CDPR: 1981 (<10), 1984 (10-50), and 1988 (20).
LGTH2	2017	0	CNDDB: 1981 (<10), 1983 (100+), 1986 (0), and 2017 (0).
LGTH3*	2022	0	CNDDB: 1998 (0), 2015 (0), and 2017 (0). CDPR: 1990 (48), 1998 (2), 2015 (0), and 2022 (0). Presumed extirpated.
LGTH4*	2022	0	CNDDB: General SE polygon (Lettuce Lake): 1980 (†), 1998 (0), and 2017 (0). NW polygon: 1990 (12), 1998 (0), 2015 (0), and 2017 (0). CDPR: 1990 (11), 1998 (0), 2015 (0), and 2022 (0). Presumed extirpated.
LGTH5*	2022	0	CDPR: 1990 (34), 1998 (0), 2015 (0), and 2022 (0). Presumed extirpated.
LGTH6*	2022	0	CNDDB: 1975 (†), 2015 (0), and 2017 (0). CDPR: 2022 (0). Presumed extirpated.
LGTH7*	2023	14	CNDDB: 2016 (37), 2017 (65), 2018 (0), and 2019 (15). CDPR (Surprise Lake): 1981 (<50), 1986 (0), 1987 (50), 1990 (27), 1997 (54); 1998 (7), 2008 (10), 2013 (37), 2015 (1), 2017 (8), 2020 (17), 2021 (45), 2022 (12), and 2023 (14).
LGTH8	2019	64	CNDDB: 1997 (87), 2007 (50), 2008 (†), 2010 (300), 2013 (172), 2014 (10), 2017 (>5, in fruit), 2018 (†), and 2019 (64).
LGTH9	2017	0	CNDDB: 2005 (420), 2006 (280), 2007 (119), 2008 (94), 2009 (23), 2010 (34), 2011 (35), 2012 (18), 2013 (12), 2014 (1), 2015 (0), 2016 (0), and 2017 (0).
LGTH10	2019	212	CNDDB: 1990 (137), 1995 (31), 2000-2002 (†), 2006 (2,240), 2007 (1,558), 2008 (1,005), 2009 (280), 2010 (240), 2011 (247), 2012 (649), 2013 (2,812), 2014 (23,500), 2015 (5,374), 2016 (803), 2017 (913) and 2019 (212).
LGTH11	2019	199	CNDDB: 1983 (1,000-10,000), 1986 (~6,000), 1990 (54,000), 2006 (1,746), 2007 (1,339), 2008 (8,362); 2009 (9,751), 2010 (4,464), 2014 (3,861), 2015 (2,833), 2016 (1,510), 2017(†), and 2019 (199).
LGTH12	2017	0	CNDDB: 1991 (~100) and 2017 (0).
LGTH13	2017	0	CNDDB: 1983 (†), 2005 (0), 2013 (0), and 2017 (0).

***Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.**
****Numbers of plants/stems observed in parentheses. Dagger (†) indicates plants were detected during survey but not counted.**

La Graciosa Thistle
- La Graciosa thistle critical habitat
- La Graciosa thistle occurrence

Base Map Features
- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

0 0.5 1 2 Mile

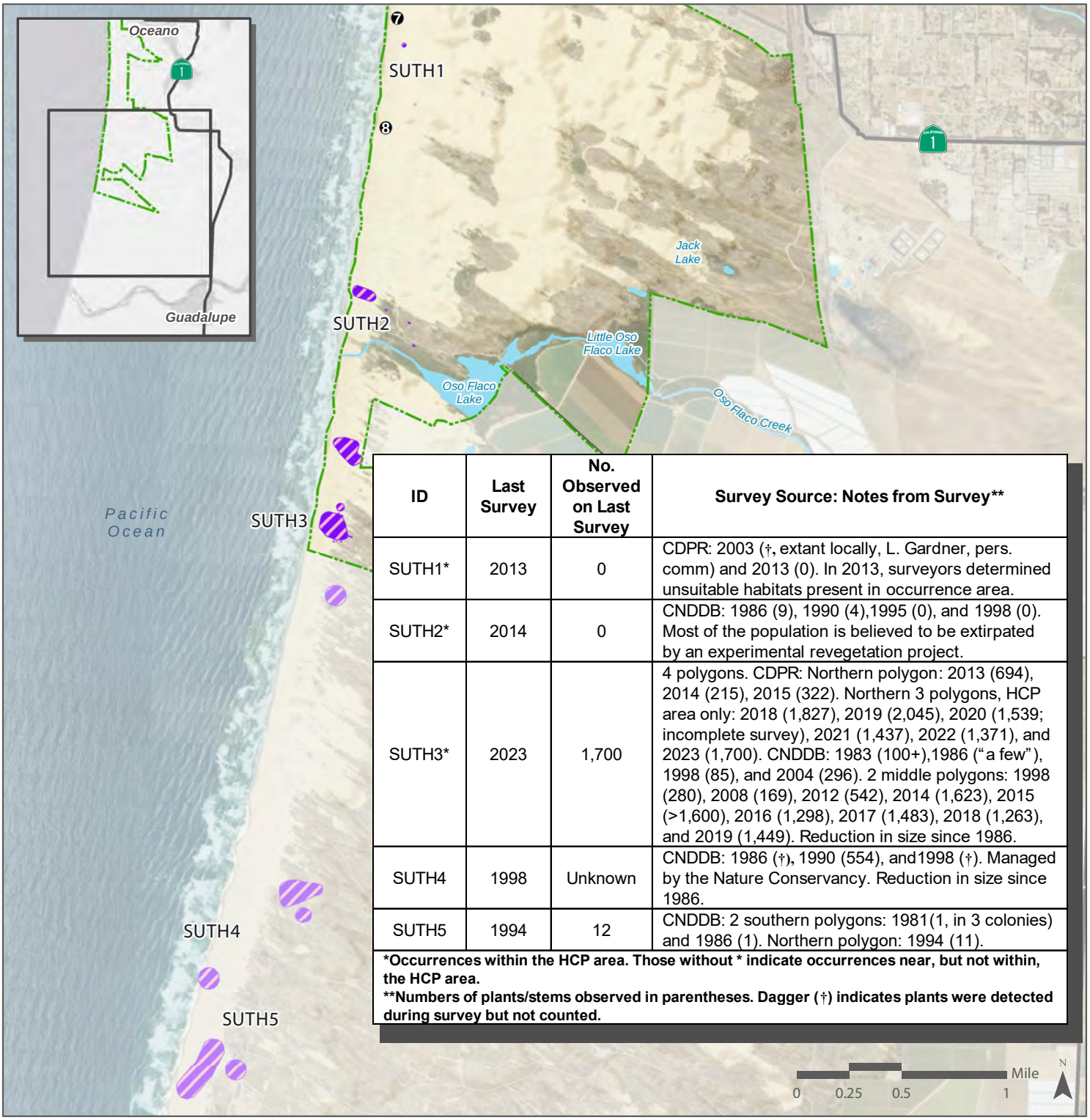
N

MIG

July 2025
Source: USFWS 2009; CDPR 2024; CNDDB 2024; MIG 2024

Map 20 La Graciosa Thistle Occurrences and Critical Habitat in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last Survey	No. Observed on Last Survey	Survey Source: Notes from Survey**
SUTH1*	2013	0	CDPR: 2003 (†, extant locally, L. Gardner, pers. comm) and 2013 (0). In 2013, surveyors determined unsuitable habitats present in occurrence area.
SUTH2*	2014	0	CNDDB: 1986 (9), 1990 (4),1995 (0), and 1998 (0). Most of the population is believed to be extirpated by an experimental revegetation project.
SUTH3*	2023	1,700	4 polygons. CDPR: Northern polygon: 2013 (694), 2014 (215), 2015 (322). Northern 3 polygons, HCP area only: 2018 (1,827), 2019 (2,045), 2020 (1,539; incomplete survey), 2021 (1,437), 2022 (1,371), and 2023 (1,700). CNDDB: 1983 (100+),1986 ("a few"), 1998 (85), and 2004 (296). 2 middle polygons: 1998 (280), 2008 (169), 2012 (542), 2014 (1,623), 2015 (>1,600), 2016 (1,298), 2017 (1,483), 2018 (1,263), and 2019 (1,449). Reduction in size since 1986.
SUTH4	1998	Unknown	CNDDB: 1986 (†), 1990 (554), and1998 (†). Managed by the Nature Conservancy. Reduction in size since 1986.
SUTH5	1994	12	CNDDB: 2 southern polygons: 1981(1, in 3 colonies) and 1986 (1). Northern polygon: 1994 (11).

***Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.**
****Numbers of plants/stems observed in parentheses. Dagger (†) indicates plants were detected during survey but not counted.**

Surf Thistle

Surf thistle populations

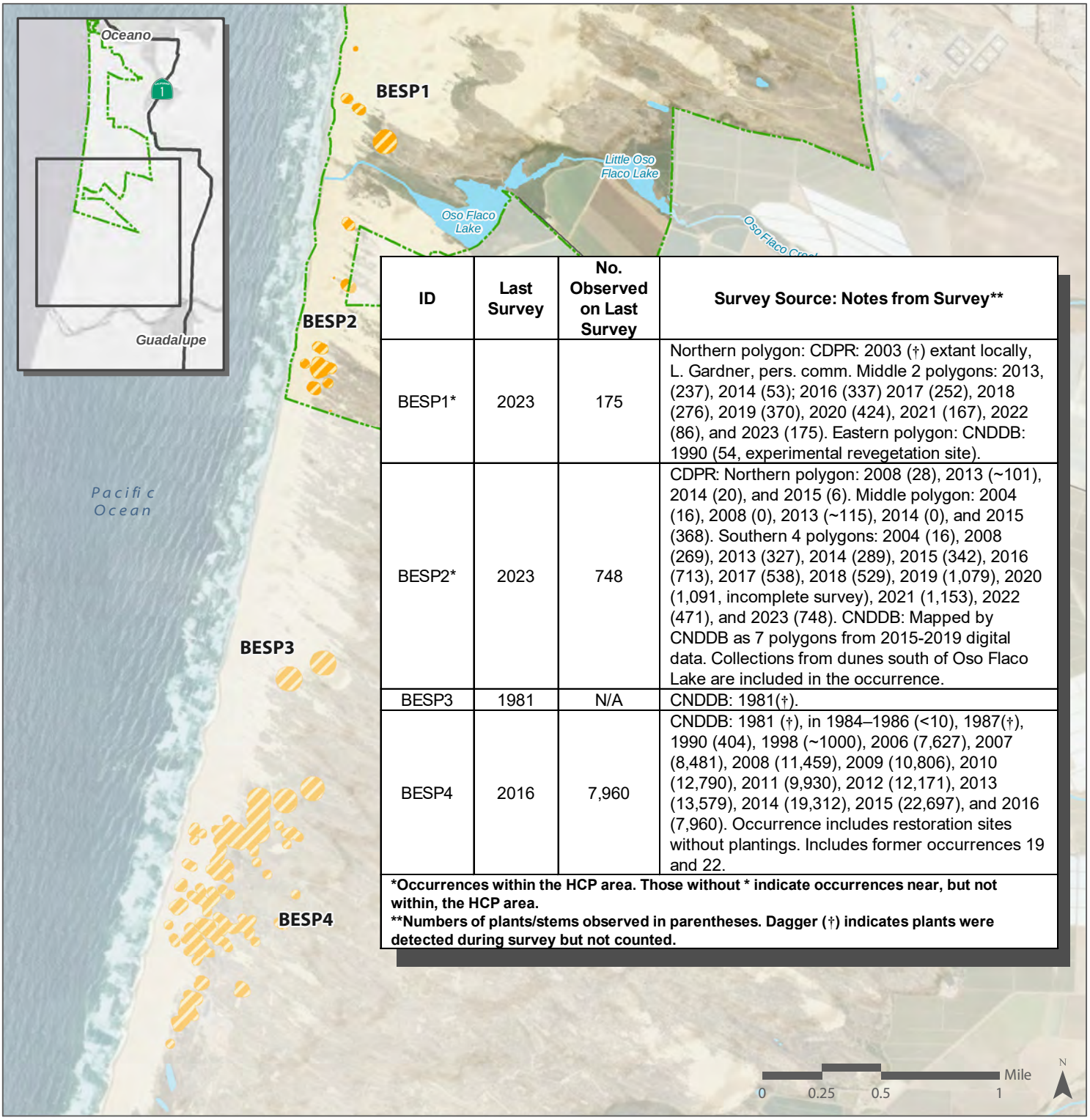
Base Map Features

- Marker post
- HCP covered lands
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CDPR, 2024; CNDDB 2024; MIG, 2024

Map 21 Surf Thistle Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last Survey	No. Observed on Last Survey	Survey Source: Notes from Survey**
BESP1*	2023	175	Northern polygon: CDPR: 2003 (†) extant locally, L. Gardner, pers. comm. Middle 2 polygons: 2013, (237), 2014 (53); 2016 (337) 2017 (252), 2018 (276), 2019 (370), 2020 (424), 2021 (167), 2022 (86), and 2023 (175). Eastern polygon: CNDDB: 1990 (54, experimental revegetation site).
BESP2*	2023	748	CDPR: Northern polygon: 2008 (28), 2013 (~101), 2014 (20), and 2015 (6). Middle polygon: 2004 (16), 2008 (0), 2013 (~115), 2014 (0), and 2015 (368). Southern 4 polygons: 2004 (16), 2008 (269), 2013 (327), 2014 (289), 2015 (342), 2016 (713), 2017 (538), 2018 (529), 2019 (1,079), 2020 (1,091, incomplete survey), 2021 (1,153), 2022 (471), and 2023 (748). CNDDB: Mapped by CNDDB as 7 polygons from 2015-2019 digital data. Collections from dunes south of Oso Flaco Lake are included in the occurrence.
BESP3	1981	N/A	CNDDB: 1981(†).
BESP4	2016	7,960	CNDDB: 1981 (†), in 1984–1986 (<10), 1987(†), 1990 (404), 1998 (~1000), 2006 (7,627), 2007 (8,481), 2008 (11,459), 2009 (10,806), 2010 (12,790), 2011 (9,930), 2012 (12,171), 2013 (13,579), 2014 (19,312), 2015 (22,697), and 2016 (7,960). Occurrence includes restoration sites without plantings. Includes former occurrences 19 and 22.

***Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.**
****Numbers of plants/stems observed in parentheses. Dagger (†) indicates plants were detected during survey but not counted.**

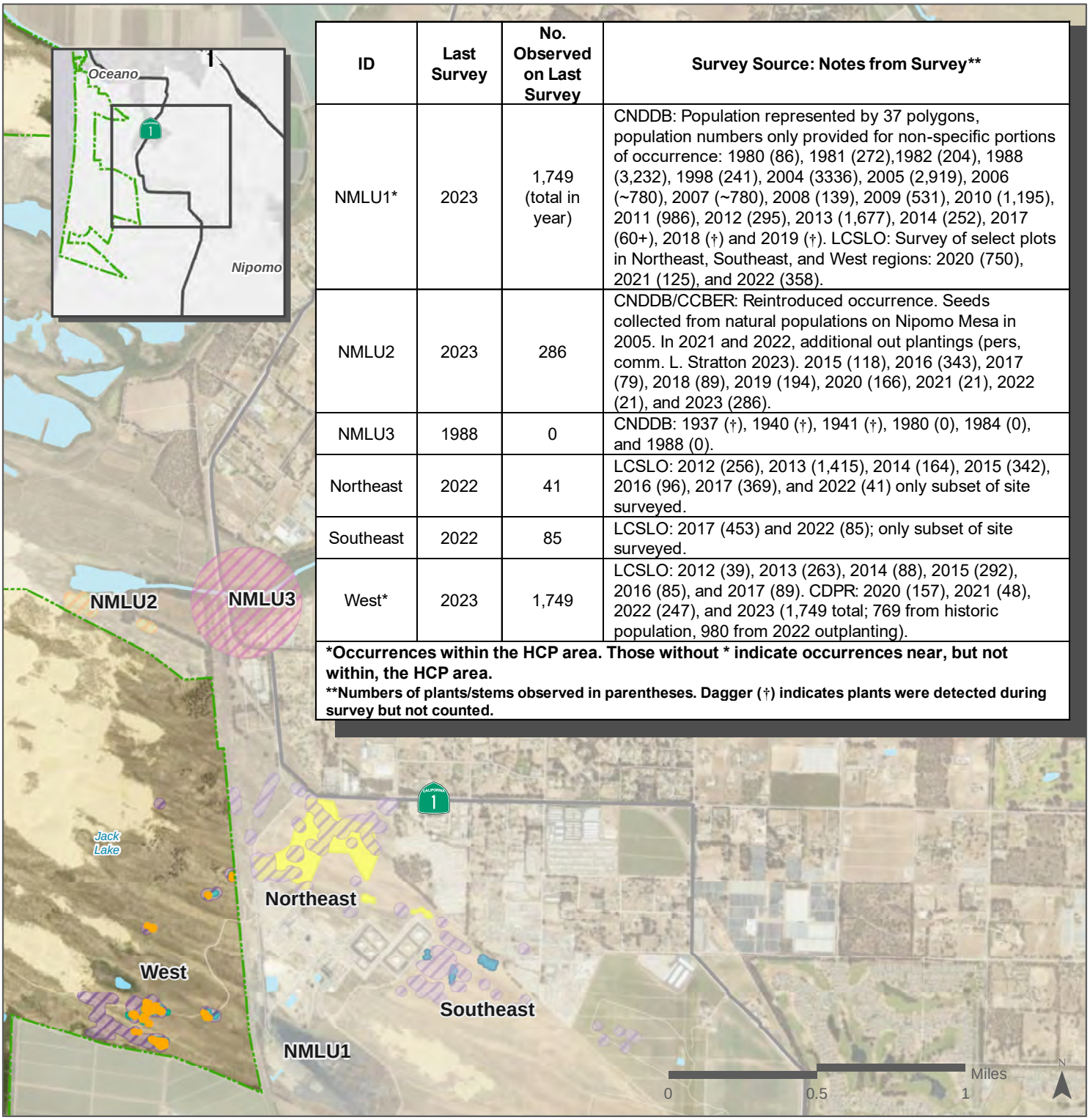
Beach Spectaclepod
- Beach spectaclepod populations

Base Map Features
- HCP covered lands
- Waterbody
- Stream
- Access road
- Highway

July 2025
Source: CDPR 2024; CNDDB 2024; MIG 2024

Map 22 Beach Spectaclepod Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last Survey	No. Observed on Last Survey	Survey Source: Notes from Survey**
NMLU1*	2023	1,749 (total in year)	CNDDB: Population represented by 37 polygons, population numbers only provided for non-specific portions of occurrence: 1980 (86), 1981 (272),1982 (204), 1988 (3,232), 1998 (241), 2004 (3336), 2005 (2,919), 2006 (~780), 2007 (~780), 2008 (139), 2009 (531), 2010 (1,195), 2011 (986), 2012 (295), 2013 (1,677), 2014 (252), 2017 (60+), 2018 (†) and 2019 (†). LCSLO: Survey of select plots in Northeast, Southeast, and West regions: 2020 (750), 2021 (125), and 2022 (358).
NMLU2	2023	286	CNDDB/CCBER: Reintroduced occurrence. Seeds collected from natural populations on Nipomo Mesa in 2005. In 2021 and 2022, additional out plantings (pers, comm. L. Stratton 2023). 2015 (118), 2016 (343), 2017 (79), 2018 (89), 2019 (194), 2020 (166), 2021 (21), 2022 (21), and 2023 (286).
NMLU3	1988	0	CNDDB: 1937 (†), 1940 (†), 1941 (†), 1980 (0), 1984 (0), and 1988 (0).
Northeast	2022	41	LCSLO: 2012 (256), 2013 (1,415), 2014 (164), 2015 (342), 2016 (96), 2017 (369), and 2022 (41) only subset of site surveyed.
Southeast	2022	85	LCSLO: 2017 (453) and 2022 (85); only subset of site surveyed.
West*	2023	1,749	LCSLO: 2012 (39), 2013 (263), 2014 (88), 2015 (292), 2016 (85), and 2017 (89). CDPR: 2020 (157), 2021 (48), 2022 (247), and 2023 (1,749 total; 769 from historic population, 980 from 2022 outplanting).

***Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.**

****Numbers of plants/stems observed in parentheses. Dagger (†) indicates plants were detected during survey but not counted.**

Nipomo Mesa Lupine Occurrences

CNDDB survey data
- NMLU1 population
- NMLU2 population
- NMLU3 population
- Oceano Dunes SVRA survey data (2020-2024)

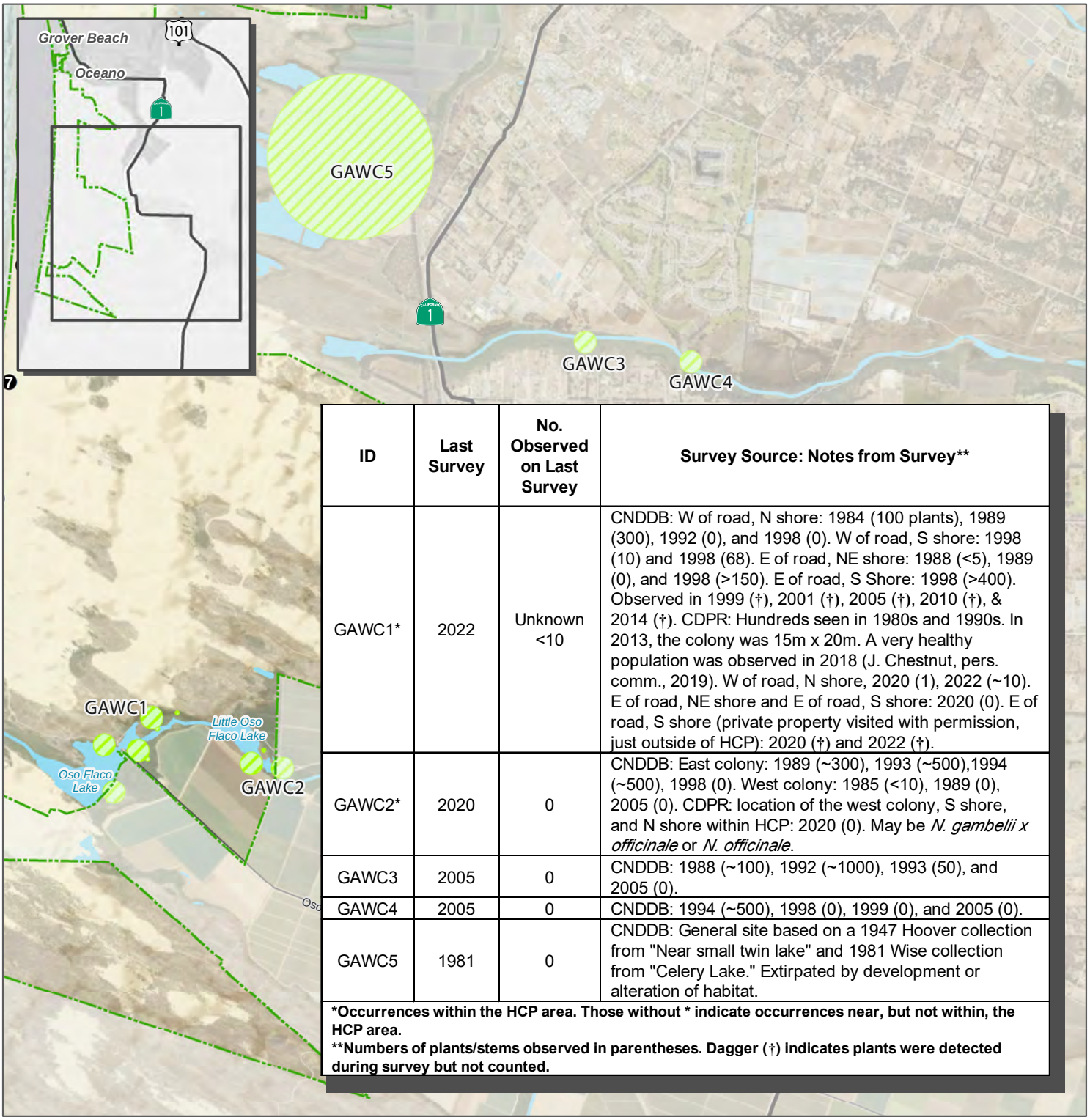
SLO Land Conservancy survey data (2012-2017)
- Northeast region
- Southeast region
- West region

Base Map Features
- HCP covered lands
- Waterbody
- Stream
- Highway

July 2025
Source: CDPR 2024; CNDDB 2024; Land Conservancy of San Luis Obispo 2019; MIG 2024

Map 23 Nipomo Mesa Lupine Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last Survey	No. Observed on Last Survey	Survey Source: Notes from Survey**
GAWC1*	2022	Unknown <10	CNDDB: W of road, N shore: 1984 (100 plants), 1989 (300), 1992 (0), and 1998 (0). W of road, S shore: 1998 (10) and 1998 (68). E of road, NE shore: 1988 (<5), 1989 (0), and 1998 (>150). E of road, S Shore: 1998 (>400). Observed in 1999 (†), 2001 (†), 2005 (†), 2010 (†), & 2014 (†). CDPR: Hundreds seen in 1980s and 1990s. In 2013, the colony was 15m x 20m. A very healthy population was observed in 2018 (J. Chestnut, pers. comm., 2019). W of road, N shore, 2020 (1), 2022 (~10). E of road, NE shore and E of road, S shore: 2020 (0). E of road, S shore (private property visited with permission, just outside of HCP): 2020 (†) and 2022 (†).
GAWC2*	2020	0	CNDDB: East colony: 1989 (~300), 1993 (~500),1994 (~500), 1998 (0). West colony: 1985 (<10), 1989 (0), 2005 (0). CDPR: location of the west colony, S shore, and N shore within HCP: 2020 (0). May be *N. gambelii x officinale* or *N. officinale*.
GAWC3	2005	0	CNDDB: 1988 (~100), 1992 (~1000), 1993 (50), and 2005 (0).
GAWC4	2005	0	CNDDB: 1994 (~500), 1998 (0), 1999 (0), and 2005 (0).
GAWC5	1981	0	CNDDB: General site based on a 1947 Hoover collection from "Near small twin lake" and 1981 Wise collection from "Celery Lake." Extirpated by development or alteration of habitat.

***Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.**
****Numbers of plants/stems observed in parentheses. Dagger (†) indicates plants were detected during survey but not counted.**

Gambel's Watercress
- Gambel's watercress occurrences

Base Map Features
- HCP covered lands
- Marker post
- Waterbody
- Stream
- Highway
- Access road

0 0.65 1.3 Mile

N

July 2025
Source: CDPR 2024; CNDDB 2024; MIG 2024

Map 24 Gambel's Watercress Occurrences in and near the HCP Area



Covered Activities, Land Use & Park Facilities

- Vegetation and dust control islands
- Oso Flaco boardwalk
- Symbolic fence (breeding season only)
- Wind fencing
- Boneyard gate
- Restrooms
- Air quality monitor
- CA-26 Riparian maintenance location
- CA-41 Pedestrian bridge*
- Sand Highway*
- CA-44 Track-out device

- CA-44 48-acre foredune
- CA-50 6 Exclosure reduction*
- CA-50 Boneyard Exclosure reduction

Kiteboarding landing/launching

- Wet/dry allowed
- Wet only

Note: For allowable land uses, please refer to Map 3.

Western Snowy Plover Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat

Base Map Features

- Marker post
- HCP covered lands
- Boundary of Exclosures
- Year-round open riding limits
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CDPR 2024
MIG 2024

*Approximate location

Map 25 Western Snowy Plover Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Covered Activities, Land Use & Park Facilities

- Vegetation and dust control islands
- Oso Flaco boardwalk
- Symbolic fence (breeding season only)
- Wind fencing
- Boneyard gate
- Restrooms
- Air quality monitor
- CA-26 Riparian maintenance location
- CA-41 Pedestrian bridge*
- Sand Highway*
- CA-44 Track-out device
- CA-44 48-acre foredune
- CA-50 6 Exclosure reduction*
- CA-50 Boneyard Exclosure reduction

Kiteboarding landing/launching

- Wet/dry allowed
- Wet only

Note: For allowable land uses, please refer to Map 3.

California Least Tern Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat
- Foraging habitat

Base Map Features

- Marker post
- HCP covered lands
- Boundary of Exclosures
- Year-round open riding limits
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: CDPR 2024
MIG 2024

*Approximate location

Map 26 California Least Tern Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Southwestern Pond Turtle Habitat

- Potential SWPT aquatic habitat - USFWS National Wetland Inventory
- Potential SWPT breeding habitat - 500m distance from aquatic habitat

- Boneyard gate
- Guiton crossing
- CA-41 Pedestrian bridge*
- CA-26 Riparian maintenance location
- Sand Highway*

Base Map Features

- Marker post
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: USFWS 2016
CDPR 2024; MIG 2024

Covered Activities, Land Use & Park Facilities

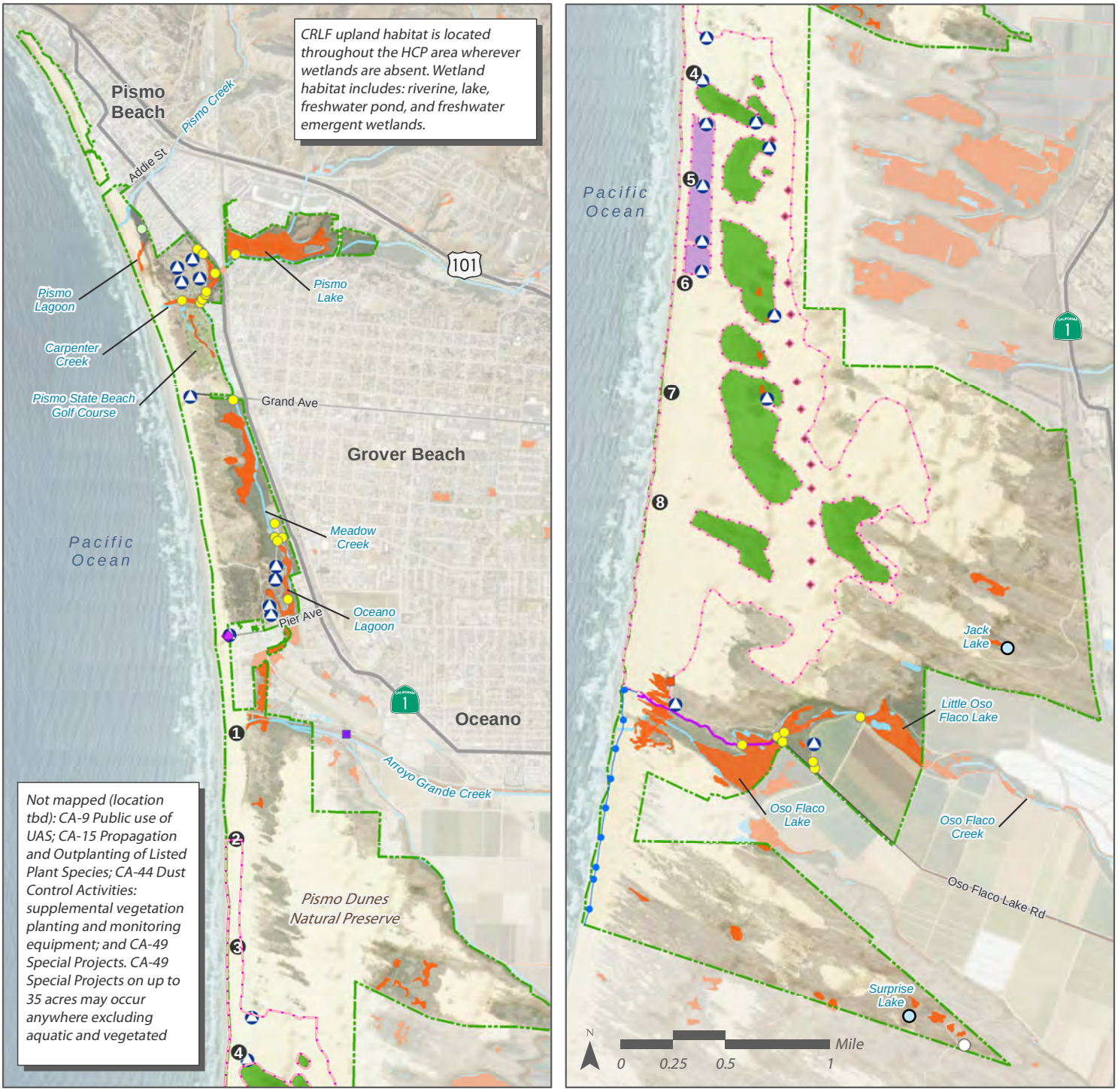
- CA-16 Dune slack wetland restoration (potential site)*
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- Vegetation and dust control islands
- Oso Flaco boardwalk
- Restrooms
- Air quality monitor

Note: For allowable land uses, please refer to Map 3.

*Approximate location

Map 27 Southwestern Pond Turtle Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



California Red-legged Frog Habitat

- Potential CRLF breeding habitat - USFWS National Wetland Inventory

Covered Activities, Land Use & Park Facilities

- CA-16 Dune slack wetland restoration (potential site)*
- CA-44 PMRP, Foredune to be planted
- Vegetation and dust control islands
- Oso Flaco boardwalk
- Restrooms
- Air quality monitor

*Approximate location

- Boneyard gate
- Guiton crossing
- CA-41 Pedestrian bridge*
- CA-26 Riparian maintenance location
- Sand Highway*

Note: For allowable land uses, please refer to Map 3.

Base Map Features

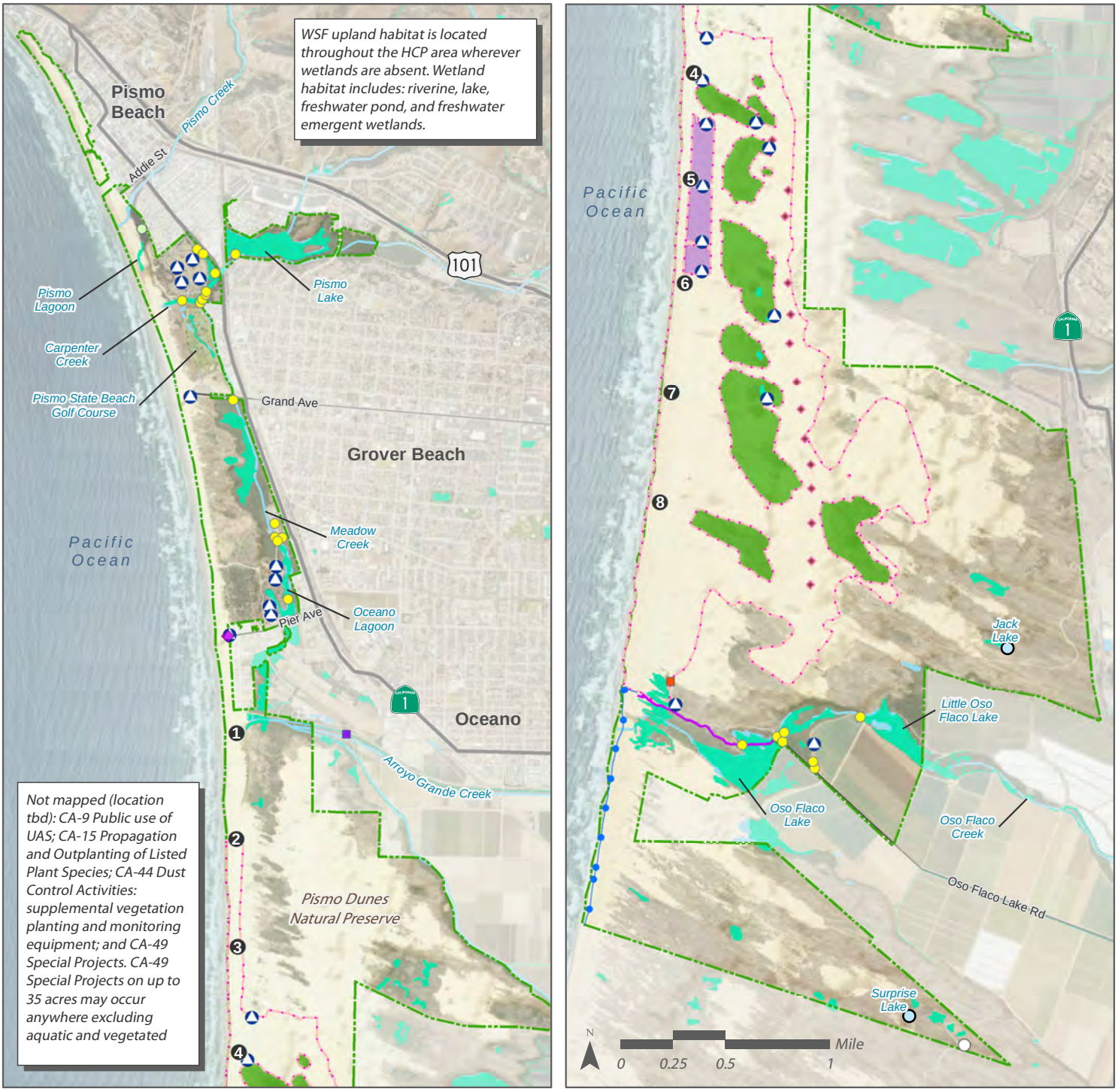
- Marker post
- HCP covered lands
- Open riding limits
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: USFWS 2016
CDPR 2024; MIG 2024

Map 28 California Red-legged Frog Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Western Spadefoot Habitat

- Potential WSF breeding habitat - USFWS National Wetland Inventory

Covered Activities, Land Use & Park Facilities

- CA-16 Dune slack wetland restoration (potential site)*
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- Vegetation and dust control islands
- Oso Flaco boardwalk
- Restrooms
- Air quality monitor

- Boneyard gate
- Guiton crossing
- CA-41 Pedestrian bridge*
- CA-26 Riparian maintenance location
- Sand Highway*

Note: For allowable land uses, please refer to Map 3.

Base Map Features

- Marker post
- HCP covered lands
- Open riding limits
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: USFWS 2016
CDPR 2024; MIG 2024

*Approximate location

Map 29 Western Spadefoot Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Tidewater Goby Habitat

- Tidewater goby critical habitat
- Tidewater goby occupied habitat

Covered Activities & Land Use

- Wind fencing
- Guiton crossing
- CA-41 Pedestrian bridge*
- CA-26 Riparian maintenance
- CA-40 Vehicle crossing
- CA-40 CDPR vehicle crossing only

Note: For allowable land uses, please refer to Map 3.

Base Map Features

- Marker post
- HCP covered lands
- Open riding limits
- Waterbody
- Stream
- Highway
- Access road

July 2025
Source: USFWS 2016
CDPR 2024; MIG 2024

*Approximate location

Map 30 Tidewater Goby Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Sensitive Plant Habitats

- Marsh sandwort / Gambel's watercress
- Nipomo Mesa lupine
- Surf thistle / Beach spectaclepod
- La Graciosa thistle critical habitat

*Approximate location

Note: For allowable landuses, please refer to Map 3.

Covered Activities & Land Use

- Wind fencing
- Vegetation and Dust Control Islands
- CA-16 Dune slack wetland restoration (potential site)*
- CA-42 Limited Trail Riding
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- CA-50 6 Exclosure reduction
- CA-50 Boneyard Exclosure reduction

Base Map Features

- Marker post
- HCP covered lands
- Boundary of Exclosures
- Open riding limits
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2025
Source: CDPR 2024; MIG 2024

Map 31 Modeled Plant Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan

Chapter 10. Bibliography

Abrecht, M., and D. K. Jacobs. 2025. *eDNA metabarcoding survey of the northern tidewater goby (Eucyclogobius newberryi) in Pismo State Beach and Oceano Dunes State Vehicular Recreation Area.* UCLA.

Adams, M. J., and C. A. Pearl. 2007. "Problems and opportunities managing invasive bullfrogs: is there any hope?" *Biological invaders in inland waters: Profiles, distribution, and threats*, 679-693.

Al-Shehbaz, I. A. 2017. *Dithyrea maritima*, in Jepson Flora Project (eds.).

Althouse and Meade, Inc. 2005, amended 2009. Biological Assessment for Grover Beach Conference Center. Prepared for City of Grover Beach.

Alvarez, Jeff, pers. comm. 2025. Workshop conducted at Oceano Dunes District.

American Ornithological Society. 2024. *Checklist of North and Middle Americas Birds.* Accessed October 11, 2024. https://checklist.americanornithology.org/taxa/15074.

American Ornithologist's Union (AOU). 1957. The A.O.U. *Checklist of North American Birds*. Fifth Edition, 168 pp.

Anderson, W. 1970. “The California Least Tern Breeding in Alameda and San Mateo Counties.” *California Fish & Game*, 56: 136-137.

Atwood, J. L., and B.W. Massey. 1988. "Site Fidelity of the Least Terns in California." *The Condor 90* 389-394.

Atwood, J. L., and D. E. Minsky. 1983. “Least Tern Foraging Ecology at Three Major California Breeding Colonies.” *Western Birds*, 14: 57-72.

Austin, L., and N. Hammond. 2010. *Images of America Oceano*. Arcadia Publishing.

Barr, Jared, M. Clay Green, Stephen DeMaso, and Thomas Hardy. 2020. "Drone Surveys Do Not Increase Colony-wide Flight Behaviour at Waterbird Nesting Sites, but Sensitivity Varies Among Species." *Scientific Reports* (Nature Research) 10:3781. https://doi.org/10.1038/s41598-020-60543-z.

Baumberger, Katherine, M. V. Eitzel, Matthew Kirby, and Michael Horn. 2019. "Movement and habitat selection of the western spadefoot (Spea *hammondii*) in southern California." *PLOS | ONE.* https://doi.org/10.1371/journal.pone.0222532.

Bender, K. 1973. *California Least Tern Census and Nesting Survey, 1973*, California Department of Fish and Game (CDFG), Special Wildlife Investigations, Project W-54-R, Final Report, Job II, 11, 7 pp. plus appendix.

Bender, K. 1974. California Least Tern Population and Nesting Survey, 1974, California Department of Fish and Game, Nongame Wildlife Investigations, Project W-54-R, Job II.5.1, 5 pp. plus appendix.

Bobzien, S., and J.E. DiDonato. 2007. The Status of the California Tiger Salamander (*Ambystoma californiense*), California Red-Legged Frog (*Rana draytonii*), Foothill Yellow-legged Frog (*Rana boylii*), and other Aquatic Herpetofauna in the East Bay Regional Park District, California, East Bay Regional Park District, Oakland, Ca.

Brindock, K. M., and M. A. Colwell. 2011. "Habitat Selection by Western Snowy Plovers During the Nonbreeding Season." *The Journal of Wildlife Management 75: 786-793.*

Brown, K. M., and R. D. Morris. 1994. The Influence of Investigator Disturbance on the Breeding Success of Ring billed Gulls (*Larus delawarensis*). Colonial Waterbirds 17: 7-17.

Brown, K. M., and R. D. Morris. 1995. "Investigator Disturbance, Chick Movement, and Aggressive Behavior in Ring Billed Gulls." *Wilson Bulletin* 107: 140-152.

Brown, K.P., J. Jansen, and P. Innes. 1998. "Identifying Predators at Nests of Small Birds in a New Zealand Forest." *Ibis* 140: 274-279.

Bulger, J. B., N. J. Jr. Scott, and R. B. Seymour. 2003. "Terrestrial Activity and Conservation of Adult California Red-Legged Frogs *Rana aurora draytonii* in Coastal Forests and Grasslands." *Biological Conservation* 110: 85-86.

Burger, J. 1981. "Effects of Human Disturbance on Colonial Species, Particularly Gulls." *Colonial Waterbirds* 4: 28-36.

Burger, J. 1994. "The Effect of Human Disturbance on Foraging Behavior and Habitat Use in Piping Plover (*Charadrius melodus*)." *Estuaries* 17: 695-701.

Burton, R. K. 1996. Single nest Exclosures to Protect Endangered California Least Terns from Off Highway Vehicle (OHV) Traffic.

Burton, R. B., and M. J. Kutilek. 1997. Nocturnal Habits of Western Snowy Plovers at Oceano Dunes State Vehicular Recreation Area (SVRA). Prepared for the California Department of Parks and Recreation (CDPR) Off-Highway Motor Vehicle Recreation (OHMVR) Division. Final Report, 15 pp + Appendix.

Bury, R. Bruce, Hartwell H. Welsh, David J. Germano, and Donald T. Ashton. 2012. "Western Pond Turtle: Biology, Sampling Techniques, Inventory and Monitoring, Conservation, and Management." *Northwest Fauna, A Monograph of Vertebrate Biology* 7: 1-128.

Butchko, P. H. 1990. Predator Control for the Protection of Endangered Species in California. *Proceedings of the Fourteenth Vertebrate Pest Conference*.

Butchko, P. H., and M. A. Small. 1992. Developing a Strategy of Predator Control for the Protection of the California Least Tern: a Case History. *Proceedings of the Fourteenth Vertebrate Pest Conference.* 15: 29-31.

Caffrey, C. 1998. California Least Tern Breeding Survey, 1996 Season. CDFG, Wildlife Management Division, Bird and Mammal Conservation Program Rep. 98-2, Sacramento, CA. 57 pp.

California Department of Fish and Game [CDFG]. 2005. The Status of Rare, Threatened, and Endangered Plants and Animals of California 2002-2004.

California Department of Fish and Wildlife [CDFW]. 2016. "2016 Nesting Plan for California Least Tern at Oceano Dunes SVRA." Letter from Julie Vance, CDFW, to Brent Marshall, CDPR, dated March 3, 2016.

CDFW. 2021. *Oceano Dunes Biodiversity Management Plan.* California Department of Fish and Wildlife in Cooperation with California State Parks. January 13, 2021.

CDFW. 2024. "2024 California Least Tern Information and Coordination Meeting." Agenda for February 15, 2024, meeting.

CDFW-OSPR. 2023. "Habitat Restoration for Recovery of Federally Listed Species at Black Lake Ecological Area." CDFW-OSPR status update.

California Department of Parks and Recreation [CDPR]. 1975. *Pismo State Beach and Pismo Dunes State Vehicular Recreation Area General Development Plan and Resource Management Plan.* Department of Parks & Recreation. April 1975.

CDPR. 1982. *Pismo State Beach and Pismo Dunes State Vehicular Recreation Area Draft Proposed Amendment to General Development Plan*. State of California Department of Parks and Recreation. CDPR. July 1982.

CDPR. 1994a. *Oceano Dunes State Vehicular Recreation Area General Plan Amendment.* California State Park and Recreation Commission.

CDPR. 1994b. *Pismo Dunes State Vehicular Recreation Area Access Corridor Project, Final Environmental Impact Report.* CDPR, OHMVR Division. February 1994.

CDPR. 1999a. *1998 Western Snowy Plover and California Least Tern Breeding Season at Oceano Dunes State Vehicular Recreation Area, California. Final Report of the California Department of Parks and Recreation.* CDPR, Oceano Dunes District. 48 pp + Figures.

CDPR. 1999b. *1999 Western Snowy Plover and California Least Tern Breeding Season at Oceano Dunes State Vehicular Recreation Area, California.* CDPR, Oceano Dunes District.

CDPR. 2001a. *2000 Nesting Season California Least Tern and Western Snowy Plover At Oceano Dunes State Vehicular Recreation Area.* CDPR, Oceano Dunes District.

CDPR. 2001b. *Oceano Dunes State Vehicular Recreation Area Wildlife Habitat Protection Plan.* Oceano Dunes District, CDPR, Off-Highway Motor Vehicle Recreation Division, August 2001.

CDPR. 2004. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2004 Season.* CDPR, Oceano Dunes District. December 2004.

CDPR. 2005. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2005 Season.* CDPR, Oceano Dunes District. November 2005.

CDPR. 2006. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2006 Season.* CDPR, Oceano Dunes District. October 2006.

CDPR. 2007. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2007 Season.* CDPR, Oceano Dunes District.

CDPR. 2008a. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2008 Season.* CDPR, Oceano Dunes District.

CDPR. 2008b. *Rare Plant Surveys for Covered Species Under the Proposed Oceano Dunes Habitat Conservation Plan.* CDPR, Oceano Dunes District (data only, no written report).

CDPR. 2009a. *California State Parks Off-Highway Motor Vehicle Recreation Division Strategic Plan.* CDPR, OHMVR Division.

CDPR. 2009b. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2009 Season.* CDPR, Oceano Dunes District.

CDPR. 2010. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2010 Season.* CDPR, Oceano Dunes District. November 2010.

CDPR. 2011. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2011 Season.* CDPR, Oceano Dunes District. November 2011.

CDPR. 2012a. *Draft Habitat Monitoring Report, Oceano Dunes State Vehicular Recreation Area, 2004-2010.* CDPR, Oceano Dunes District.

CDPR. 2012b. *Oceano Dunes District Routine Riparian Maintenance Mitigated Negative Declaration/Initial Study.* CDPR, OHMVR Division. October 2012.

CDPR. 2012c. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2012 Season.* CDPR, Oceano Dunes District. November 2012.

CDPR. 2013. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2013 Season.* CDPR, Oceano Dunes District. December 2013.

CDPR. 2014a. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2014 Season.* CDPR, Oceano Dunes District. November 2014.

CDPR. 2015a. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2015 Season.* CDPR, Oceano Dunes District. November 2015.

CDPR. 2015b. *Habitat Monitoring Report, Oceano Dunes State Vehicular Recreation Area, 2010-2014.* CDPR, Oceano Dunes District.

CDPR. 2016. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2016 Season.* CDPR, Oceano Dunes District. November 2016.

CDPR. 2017a. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2017 Season.* CDPR, Oceano Dunes District.

CDPR. 2017b. *Oceano Dunes State Vehicular Recreation Area Wildlife Habitat Protection Plan.* CDPR, Oceano Dunes District.

CDPR. 2017c. "Re: Oceano Dunes State Vehicular Recreation Area, Second Notice of Additional Endangered Species Act Violations (08EVEN00-2017-CPA-0023)." Letter from CDPR, Oceano Dunes District to USFWS, Ventura Fish and Wildlife Service Office. February 10, 2017.

CDPR. 2018a. *Oceano Dunes District Unmanned Aircraft System Protocols.* CDPR, Oceano Dunes District.

CDPR. 2018b. *Nesting of the California Least Tern and Western Snowy Plover at the Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California. 2018 Season.* CDPR, Oceano Dunes District.

CDPR. 2018c. "Nesting Season Management Plan to Avoid Take of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California."

CDPR. 2019. "Oceano Dunes State Vehicular Recreation Area Draft Particulate Matter Reduction Plan." CDPR, Oceano Dunes District. June 2019.

CDPR. 2020. *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2020 Season. Oceano Dunes District.* CDPR, Oceano Dunes District. December 2020.

CDPR. 2021. *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2021 Season.* CDPR, Oceano Dunes District. December 2021.

CDPR. 2022. *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2022 Season.* CDPR, Oceano Dunes District. November 2022.

CDPR. 2023. *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2023 Season.* CDPR, Oceano Dunes District. November 2023.

CDPR. 2024a. "2022 Oceano Dunes District Visitor Use Numbers for HCP." CDPR, Oceano Dunes District.

CDPR. 2024b. *Oceano Dunes District Small Unmanned Aircraft Systems Operations Manual.* CDPR, Oceano Dunes District. Adopted April 2024.

CDPR. 2024c. *Oceano Dunes State Vehicular Recreation Area Wildlife Habitat Protection Plan Draft.* Prepared by Oceano Dunes District.

California Department of Water Resources [DWR]. 2015. California's Most Significant Droughts: Comparing Historical and Recent Conditions.

California Geological Survey [CGS]. 2007. Review of Vegetation Islands, Oceano Dunes SVRA. CGS Veg Islands Study.

California Irrigation Management Information System [CIMIS]. 2014. Weather - San Luis Obispo County, Nipomo Station. http://cesanluisobispo.ucanr.edu/about/weather_189/?weather=station&station=202.

CIMIS. 2015. San Luis Obispo County, Nipomo Station. http://cesanluisobispo.ucanr.edu/about/weather_189/?weather=station&station+202.

CIMIS. 2016. Weather - San Luis Obispo County, Nipomo Station. https://cesanluisobispo.ucanr.edu/about/weather_189/?weather=station&station=2002.

CIMIS. 2017. Weather - San Luis Obispo County, Nipomo Station. http://cesanluisobispo.ucanr.edu/about/weather_189/?weather=station&station=202.

CIMIS. 2018. Weather - San Luis Obispo County, Nipomo Station. http://cesanluisobispo.ucanr.edu/about/weather_189/?weather=station&station=202.

California Natural Diversity Database [CNDDB]. 2024.. Edited by Biogeographic Data Branch California Department of Fish & Wildlife. Accessed 2024.

California Native Plant Society [CNPS]. 2024. Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). https://www.rareplants.cnps.org.

Carney, K. M., and W. J. Sydeman. 1999. A Review of Human Disturbance Effects on Nesting and Colonial Waterbirds 22: 68-79.

Catlin, D. H., J. H. Felio, and J. D. Fraser. 2011. "Effect of Great Horned Owl Trapping on Chick Survival in Piping Plovers." *Journal of Wildlife Management 75: 458-462.*

Chabot, Dominique, Shawn Cralk, and David Bird. 2015. *Population Census of a Large Common Tern Colony with a Small Unmanned Aircraft.* PLoS ONE 10(4).

Chestnut, J. 1998. Reconnaissance Survey for Rare Plants on the Oceano Dunes SVRA. Unpublished report prepared for California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, Oceano Dunes SVRA.

Chestnut, J., pers. comm. 2013. September 25. Gambel's watercress observations.

Chestnut, pers. comm. 2019. Gambel's watercress and marsh sandwort observations. Follow-up from PWP meeting.

Cleveland, Cindy. 2009. "Frog Locations Spreadsheet of Occurrences." Cleveland Biological.

Cleveland, Cindy. 2014. pers. comm. "California Red-Legged Frog in the Oceano Dunes SVRA and Pismo State Beach. Email communication. October 22."

Cleveland, Cindy. 2017. pers. comm. "California Red-Legged Frog in the Oceano Dunes SVRA and Pismo State Beach. Email communication."

Cleveland, Cindy. 2018a. *California Red-Legged Frog Survey Report (2017), Prepared for: Oceano Dunes District, OHMVR Division.* Cleveland Biological. February 2018.

Cleveland, Cindy. 2018b. *California Red-Legged Frog Survey Report, Prepared for: Oceano Dunes District, OHMVR Division.* Cleveland Biological. October 23, 2018.

Cleveland, Cindy. 2023. *California Red-Legged Frog Survey Report, Prepared for: Oceano Dunes District, OHMVR Division.* Cleveland Biological.

Cohen, J. B., M. M. Durkin, and M. Zdravkovic. 2014. Human Disturbance of Snowy Plovers (Charadrius nivosus) in Northwest Florida During the Breeding Season. Florida Field Naturalist 42: 1-44.

Colwell, M. A., C. B. Millett, J. j. Meyer, J. N. Hall, S. J. Hurley, S. E. McAllister, A. N. Transou, and R. R. LeValley. 2005. "Snowy Plover Reproductive Success in Beach and River Habitats." *Journal of Field Ornithology 76: 373-382.*

Colwell, M. A., N. S. Burrell, M. A. Hardy, K. Kayano, J. J. Muir, W. J. Pearson, S. A. Peterson, and K. A. Sesser. 2010. "Arrival Times, Laying Dates, and Reproductive Success of Snowy Plovers in Two Habitats in Coastal Northern California." *Journal of Field Ornithology 81: 349-360.*

Colwell, M. A., S. J. Hurley, J. N. Hall, and S. J. Dinsmore. 2007. Age-related Survival and Behavior of Snowy Plover Chicks. The Condor 109: 638-647.

Coastal San Luis Resource Conservation District [CSLRCD]. 2011. Final Report for the Pismo Creek Estuary Enhancement Project. Prepared for California Department of Parks and Recreation, Oceano Dunes District.

CSLRCD. 2013. Oso Flaco Lake Watershed. Accessed May 22, 2013. http://www.coastalrcd.org/watershed_osoflaco_lake.php.

Cubasch, U. D., D. Wuebbles, D. Chen, M. C. Facchini, D. Frame, N. Mahowald, and J. G. Winther. 2013. Introduction. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, UK.

Dawson, M. N., J. L. Stanton, and D. K. Jacobs. 2001. Phylogeography of the tidewater goby, Eucyclogobius newberryi (Teleostei, Gobiidae), in coastal California. Evolution 55: 1167-1179.

Demers, S. A., and C. W. Robinson-Nilsen. 2012. "Monitoring Western Snowy Plover Nests with Remote Surveillance Systems in San Francisco Bay, California." *Journal of Fish and Wildlife Management 3: 123-132.*

Department of Defense. 2022. *DOD Legacy Resource Management Program, Recommended Best Management Practices for the Western Spadefoot on DOD Installations, DOD Partners in Amphibian and Reptile Conservation.* Department of Defense Partners in Amphibian and Reptile Conservation, May 2022.

Doubledee, R. A., E. B. Muller, and R. M. Nisbet. 2003. "Bullfrogs, disturbance regimes, and the persistence of California Red-Legged Frogs." *The Journal of Wildlife Management*, 424-438.

DOW Chemical Company AgroSciences. 2008. Facts on Milestone.

Elzinga, C. L., D. W. Salzer, J. W. Willoughby, and J. P. Gibbs. 2001. Monitoring Plant and Animal Populations. Blackwell Science.

ENSR International. 2005. Chlorsulfuron, Ecological Risk Assessment, Final Report. All U.S. Government Documents (Utah Regional Depository).

Environmental Protection Agency [EPA]. 1993. EPA Reregistration Eligibility Decision (RED) Facts.

EPA. 1998. Reregistration Eligibility Decision Document: Triclopyr. Office of Pesticide Programs, U.S. Government Printing Office.

EPA. 2005. Pesticide Fact Sheet: Aminopyralid. United States Office of Prevention, Pesticides Environmental Protection and Toxic Substances Agency.

EPA. 2007. Risks of Imazapyr Use to Federally Threatened California Reg-Legged Fron (Rana aurora draytonii), Pesticide Effects Determination> Environmental Effects Division, Office of Pesticide Programs, Washington D.C.

EPA. 2008. Risks of Glyphosate Use to Federally Threatened California Red-Legged Frog (*Rana aurora Draytonii*). Environmental Effects Division, Office of Pesticide Programs, Washington D.C.

EPA. 2009. Risks of Triclopyr Use to Federally Threatened California Red-Legged Frog (*Rana aurora draytonii*). Environmental Effects Division, Office of Pesticide Programs, Washington D. C.

EPA. 2021a. *Final National Level Listed Species Biological Evaluation for Glyphosate.* November. Accessed November 2024. https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-glyphosate#executive-summary.

EPA. 2021b. *Glyphosate, Atrazine, and Simazine Final Biological Evaluations Frequently Asked Questions.* November. Accessed November 2024. https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-glyphosate#executive-summary.

EPA. 2024. *Endangered Species Effects Determinations, Consultations, and Biological Opinions.* Accessed 2024. https://ordspub.epa.gov/ords/pesticides/f?p=CHEMICALSEARCH:23:0.

EPA and Office of Pesticide Programs. 2010. Ecological Risk Assessment for the Section 3 New Chemical Registration of Aminocyclopyrachlor on Non-crop Areas and Turf.

Erwin, R. M. 1989. Responses to Human Intruders by Birds Nesting in Colonies: Experimental Results and Management Guidelines. *Colonial Waterbirds* 12: 104-108.

Fancher, J. M. 1992. Population Status and Trends of the California Least Tern. *Transactions of the Western Section of the Wildlife Society* 28: 59-66.

Fellers, G. M., A. E. Launer, G. Rathbun, S. Bobzien, J. Alvarez, D. Sterner, R. B. Seymour, and M. Westphal. 2001. "Overwintering Tadpoles in the California Red-Legged Frog (Rana aurora draytonii)." *Herpetological Review* 32: 156-157.

Fellers, G. M., and P. M. Kleeman. 2007. "California Red-Legged Frog (Rana draytonii) Movement and Habitat Use: Implications for Conservation." *Journal of Herpetology 41: 276-286.*

Fetterolf, P. M. 1981. "Infanticide and Non-Fatal Attacks on Chicks by Ring Billed Gulls." *Animal Behavior* 31: 1018-1028.

Flemming, S. P., P. C. Chaisson, P. J. Austin-Smith, and R. P. Bancroft. 1988. "Piping Plover Status in Nova Scotia Related to its Reproductive and Behavioral Responses to Human Disturbance." *Journal of Field Ornithology 59: 321-330.*

Frost, N. 2013. California Least Tern Breeding Survey, 2012 Season. State of California Natural Resources Agency, Department of Fish and Wildlife, Wildlife Branch.

Frost, N. 2014. California Least Tern Breeding Survey, 2013 Season. State of California Natural Resources Agency, Department of Fish and Wildlife, Wildlife Branch.

Frost, N. 2016. California Least Tern Breeding Survey, 2015 Season.

Frost, N. 2017. California Least Tern Breeding Survey, 2016 Season.

Fugro Consultants. 2014. Northern Cities Management Area 2013 Annual Monitoring Report.

Fugro Consultants. 2015. Northern Cities Management Area 2014 Annual Monitoring Report.

Galbraith, H. 1987. Marking and Visiting Lapwing *Vanellus vanellus* Nests does not Affect Clutch Survival. Bird Study 34: 137-137.

Gardner, L., pers. comm. 2003. Rare plant occurrences.

George, Douglas. 2002. *Nesting of the California Least Tern and Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California in 2002.* PRBO Conservation Science, prepared for CDPR, OHMVR Division, Oceano Dunes District, November 2002.

George, Douglas. 2003. *Nesting of the California Least Tern and Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California 2003 Season.* PRBO Conservation Science, prepared for CDPR, OHMVR Division, Oceano Dunes District, November 2003.

Germano, David J. 2016. "The Ecology of a Robust Population of *Actinemys marmorata* in the San Joaquin Desert of California." *Copeia* (American Society of Ichthyologists and Herpetologists) 104 (3): 663-676. doi:10.1643.

Germano, David J. 2023. "Results of Trapping in 2023 for Southwestern Pond Turtles (Actinemys pallida) at the Santa Rita Ranch, San Luis Obispo County, California." Prepared for The Land Conservancy of San Luis Obispo County, Bakersfield, CA.

Germano, David J., and J. Daren Riedle. 2015. "Population Structure, Growth, Survivorship, and Reproduction of *Actinemys marmorata* from a High Elevation Site in the Tehachapi Mountains, California." *Herpetologica* (The Herpetologists' League, Inc.) 71: 102-109.

Giesy, J. P., S. Dobson, and K. R. Solomon. 2000. Ecotoxicological risk assessment for Roundup herbicide. Reviews in Environmental Contamination and Ecotoxicology 167: 35-120.

Greenwald, Glenn. 2014. "Wildlife Take to New Guadalupe-Nipomo Dunes Ponds." *Refuge Update, National Wildlife Refuge System.* Vol. 11. no. 3. USFWS, May/June.

Grinnell, J. 1928. A Distributional Summation of the Ornithology of Lower California. Univ. Calif. Publ. Zool. 32: 1-300.

GSI Water Solutions, Inc. 2018. Northern Cities Management Area 2018 Annual Monitoring Report.

Halstead, Brian, Katherine Baumberger, Adam Backlin, Patrick Kleeman, Monique Wong, Elizabeth Gallegos, Jonathan Rose, and Robert Fisher. 2021. "Conservation Implications of Spatiotemporal Variation in the Terrestrial Ecology of Western Spadefoots." *The Journal of Wildlife Management 1–17.* doi:10.1002/jwmg.22095.

Hammond, N. 2004. Oceano "Atlantic City of the West." Oceano Depot Association.

Hardy, M. A., and M. A. Colwell. 2008. The Impact of Predator Exclosures on Snowy Plover Nesting Success: a Seven-year Study. *Wader Study Group Bulletin* 114: 161-166.

Hayes, M. P., and M. R. Jennings. 1988. "Habitat Correlates of Distribution of the California Red legged Frog (Rana aurora draytonii) and the Foothill Yellow legged Frog (*Rana boylii*): Implications for Management." *Proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America.* United States Department of Agriculture, Forest Services. Pages 144-158.

Hays, D. W., S. A. McAllister, S. A. Richardson, and D. W. Stinson. 1999. *Washington State Recovery Plan for the Western Pond Turtle.* Wash. Dept. of Fish and Wildlife, Olympia., 66.

Henkel, L. A. 2001. Nesting of Western Snowy Plover and California Least Tern at Oceano Dunes SVRA in 2001. Final Report. 9 pp + Appendix.

Holland, Dan C. 1994. The Western Pond Turtle: Habitat and History, Final Report.

Hossain, M. M., G. Perhar, G. B. Arhonditsis, T. Matsuishi, A. Goto, and M. Azuma. 2013. "Examination of the effects of largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) on the ecosystem attributes of lake Kawahara-oike, Nagasaki, Japan." *Ecological Informatics* 18: 149-161.

ICF International. 2010. *Habitat Conservation Plan for the Western Snowy Plover*. Prepared for Oregon Parks and Recreation Department.

iNaturalist. 2024. *Observations near Oceano, CA.* https://www.inaturalist.org.

Isaksson, D., J. Wallander, and M. Larsson. 2007. “Managing Predation on Ground Nesting Birds: the Effectiveness of Nest Exclosures.” *Biological Conservation* 136: 136-142.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. California Dept. of Fish and Game.

Jennings, Mark R., and Marc P. Hayes. 1994. *Amphibian and Reptile Species of Special Concern in California*.

Jennings, M. R., M. P. Hayes, and D. C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to Place the California Red-Legged Frog (*Rana aurora draytonii*) and the Western Pond Turtle (*Clemmys marmorata*) on the List of Endangered and Threatened Wildlife and Plants. Page 21.

K. Drexhage, pers. comm. 2016. California red-legged frog occurrence.

Kofron, Christopher P., Glenn M. Greenwald, Lindsey M. Roddick, Kristie Scarazzo, and Debora Kirkland. 2020. "Wetland Creation for Listed Species on Guadalupe-Nipomo Dunes National Wildlife Refuge, California." *Ecological Restoration* (University of Wisconsin Press) 38 (2): 73-77.

Krauss, N. C., A. Militello, and G. Todoroff. 2002. Barrier Breaching Process and Barrier Spit Breach, Stone Lagoon, California. Shore and Beach 70: 21-28.

Lafferty, K. D. 2001a. “Birds at a Southern California Beach: Seasonality, Habitat Use and Disturbance by Human Activity.” *Biodiversity and Conservation* 10: 1949-1962.

Lafferty, K. D. 2001b. “Disturbance to Wintering Western Snowy Plovers.” *Biological Conservation* 101: 315-325.

Lafferty, K. D., C. C. Swift, and R. F. Ambrose. 1999. "Extirpation and Recolonization in a Metapopulation of an Endangered Fish, the Tidewater Goby." *Conservation Biology* 13: 1447-1453.

Lafferty, K. D., D. Goodman, and C. P. Sandoval. 2006. "Restoration of Breeding by Snowy Plovers Following Protection From Disturbance." *Biodiversity and Conservation* 15: 2217-2230.

Lawler, S. P., D. Dritz, T. Strange, and M. Holyoak. 1999. "Effects of introduced mosquitofish and bullfrogs on the threatened California Red-Legged Frog." *Conservation Biology* 13:613-622.

Land Conservancy of San Luis Obispo [LCSLO]. 2017. Guadalupe-Nipomo Dunes 2016 Monitoring Report.

LCSLO. 2018. Guadalupe-Nipomo Dunes 2017 Monitoring Report.

Little, S., pers. comm. 2019. CRLF Update. Email communication. Senior Environmental Scientist (Specialist), CDPR, Oceano Dunes District

Little, S. pers. comm. 2024. Senior Environmental Scientist (Specialist), CDPR, Oceano Dunes District.

Lord, A. J., J. R. Waas, J. Innes, and M. J. Whittingham. 2001. “Effects of Human Approaches to Nests of Northern New Zealand Dotterels.” *Biological Conservation* 98: 233-240.

MacDonald, B., T. Longcore, and S. Dark. 2010. *Habitat Suitability Modeling for Western Snowy Plover in Central California*. The Urban Wildlands Group, Los Angeles, California, 129 pp.

Maclvor, L. H., S. M. Melvin, and C. R. Griffin. 1990. "Effects of Research Activity on Piping Plover Nest Predation." *The Journal of Wildlife Management 54: 443-447.*

Madden-Smith, Melanie, Edward Ervin, Kathie Meyer, Stacie Hathaway, and Robert Fisher. 2005. *Distribution and Status of the Arroyo Toad (Bufo californicus) and Western Pond Turtle (Emys marmorata) in the San Diego MSCP and Surrounding Areas, Final Report 10/11/05.* USGS.

Mad River Biologists. 2005. *Oceano Dunes State Vehicular Recreation Area Nighttime Riding Study*, September 19, 2005. Final Report. Prepared for California Department of Parks and Recreation ODSVRA District.

Manzo, S., E. G. Nicholson, Z. Devereux, R. N. Fisher, C. W. Brown, P. A. Scott, and H. B. Shaffer. 2021. "Conservation of northwestern and southwestern pond turtles: threats, population size estimates, and population viability analysis." *Journal of Fish and Wildlife Management* (USFWS) 12 (2): 485-501. https://doi.org/10.3996/JFWM-20-094.

Marschalek, D. A. 2007. California Least Tern Breeding Survey, 2006 Season. California Department of Fish and Game. Sacramento, CA.

Marschalek, D. A. 2008. California Least Tern Breeding Survey, 2007 Season. California Department of Fish and Game. Sacramento, CA.

Marschalek, D. A. 2009. California Least Tern Breeding Survey, 2008 Season. California Department of Fish and Game. Sacramento, CA.

Marschalek, D. A. 2010. California Least Tern Breeding Survey, 2009 Season. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Program Report, 2010-03. Sacramento, CA. 25 pp. + app.

Marschalek, D. A. 2011. California Least Tern Breeding Survey, 2010 Season. California Department of Fish and Game. Sacramento, CA.

Marschalek, D. A. 2012. California least tern breeding survey, 2011 season. Preliminary data. California Department of Fish and Game. Sacramento, CA.

Marschalek, D. A. 2012. California Least Tern Breeding Survey, 2011 Season. California Department of Fish and Game. Sacramento, CA.

Martel, Chad. 2019. *Using Environmental DNA and Occupancy Modeling to Estimate Rangewide Metapopulation Dynamics of the Endangered Tidewater Goby Eucyclogobius Spp. A Thesis Presented to The Faculty of Humboldt State University.* July 2019.

Massey, B. W. 1974. “Breeding Biology of the California Least Tern.” *Proc. Linnaean Soc.* N.Y. 72:1-24.

Massey, B. W. 1975. California Least Tern Census and Nesting Survey. Calif. Dept. of Fish and Game (Nongame Wildlife Investigations) and the U.S. Fish and Wildlife Service (Kern Pixley N.W. R. - Endangered Species Program. 5pp. + Appendix.

Massey, B. W. 1988. California Least Tern Field Study 1988 Breeding Season. CDFG.

Massey, B. W., and J. M. Fancher. 1989. "Renesting by California Least Terns." *Journal of Field Ornithology 60: 350-357.*

McCraney, W. T., G. Goldsmity, D. K. Jacobs, and A. P. Kinziger. 2010. “Rampant Drift in Artificially Fragmented Populations of the Endangered Tidewater Goby (*Eucyclogobius newberryi*).” *Molecular Ecology* 19: 3315-3327.

McLeod, E. M., P. J. Guay, A. J. Taysom, R. W. Robinson, and M. A. Weston. 2013. “Buses, Cars, Bicycles and Walkers: The Influence of the Type of Human Transport on Flight Responses of Waterbirds”. *PLoS ONE* 8.

McLeod, Malcolm. 2001. Dune Mother's Wildflower Guide: Dunes of Coastal San Luis Obispo and Santa Barbara Counties, California.

Melvin, S. M., A. Hecht, and C. R. Griffin. 1994. “Piping Plover Mortalities Caused by Off-Road Vehicles on Atlantic Coast Beaches.” *Wildlife Society Bulletin* 22: 409-414.

Melvin, S. M., L. H. Maclvor, and C. R. Griffin. 1992. “Predator Exclosures: A Technique to Reduce Predation at Piping Plover Nests.” *Wildlife Society Bulletin* 20: 143-148.

Meyer, Erik, Evan Eskew, Leah Chibwe, Jill Schrlau, Staci Simonich, and Brian Todd. 2016. "Organic contaminants in western pond turtles in remote habitat in California." *Chemosphere* 326-334. http://dx.doi.org/10.1016/j.chemosphere.2016.03.128.

MIG. 2015. *Pismo State Beach and Oceano Dunes State Vehicular Recreation Area (SVRA) Vegetation Mapping Report. Prepared for CDPR, OHMVR Division, Oceano Dunes District.* MIG. February 2023.

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish Species of Special Concern in California. Final Report for Contract No. 2128IF. Department of Fish and Game, Inland Fisheries Division. Rancho Cordova, CA.

Moyle, Peter B. 1973. "Effects of introduced bullfrogs, *Rana catesbeiana*, on the native frogs of the San Joaquin Valley, California." *Copeia*, 18-22.

Muir, J. J., and M. A. Colwell. 2010. “Snowy Plover Select Open Habitats for Courtship Scrapes and Nests.” *The Condor* 112: 507-510.

Murphy, R. K., I. M. G. Michaud, D. R. C. Prescott, J. S. Ivan, B. J. Anderson, and M. L. French-Pomber. 2003. “Predation on Adult Piping Plovers at Predator Exclosure Cages.” *Waterbirds* 26: 150-155.

National Agricultural Imagery Program. 2022. *NAIP GeoHub, U.S. Department of Agriculture.* https://naip-usdaonline.hub.arcgis.com/.

National Fish and Wildlife Foundation. 2024. Wetland Habitat Restoration Within the Guadalupe-Nipomo Dunes National Wildlife Refuge, Final Report.

National Park Service. 2016. Threatened and Endangered Vascular Plan Species Activities Within the Golden Gate National Recreation Area Including lands managed by the Presidio Trust Calendar Year 2015. Prepared by Michael R. Chasse (NPS) for U.S. Fish and Wildlife Service (USFWS), Sacramento Office, California.

Neuman, K. K. 2001. Western Snowy Plover Resource Management Plan for the North Beaches Sector of the Monterey District, California Department of Parks and Recreation. Submitted to Ken Gray, Senior Resource Ecologist and Dave Dixon, Supervising Park Ranger. 35 pp.

Neuman, K. K., G. W. Page, and D. George. 2005. Effects of Recreational Disturbance to Waterbirds on Sandy Beaches at Oceano Dunes State Vehicular Recreation Area and Adjacent Areas. Prepared for the California Department of Parks and Recreation. PRBO Conservation Science.

Neuman, K. K., G. W. Page, L. E. Stenzel, J. C. Warriner, and J. S. Warriner. 2004. "Effect of Mammalian Predator Management on Snowy Plover Breeding Success." *Journal of Waterbird Society 27: 257-376.*

Neuman, K. K., L. E. Stenzel, J. C. Warriner, G. W. Page, J. Erbes, C. R. Eyster, E. Miller, and L. A. Henkel. 2013. "Success of captive-rearing for a threatened shorebird." *Endangered Species Research* 22: 85-94.

Neuman, K. K., Nadav Nur, Jamie Miller, Julie Howar, and Dan Robinette. 2024. *Identifying Critical Drivers of Western Snowy Plover Reproductive Success to Guide Management towards Reaching Recovery Goals.* Pt. Blue Conservation Science.

Nicholson, E. G., S. Manzo, Z. Devereux, T. P. Morgan, R. N. Fisher, C. Brown, R. Dagit, P. A. Scott, and H. B. Shaffer. 2020. "Historical Museum Collections and Contemporary Population Studies Implicate Roads and Introduced Predatory Bullfrogs in the Decline of Western Pond Turtles." *PeerJ* 23. doi:10.7717.

NOAA Fisheries. 2008. Evaluation of the California Department of Parks and Recreation's Take-Avoidance Plan for San Luis Obispo Coastal Units of the State Park System. Prepared by National Marine Fisheries Service. December 23, 2008.

NOAA. 2016. *Drought in America: Slow moving, far reaching.* June 15. Accessed 2025. https://www.noaa.gov/explainers/drought-in-america-slow-moving-far-reaching.

Page, G. W. 2011. Recommendations for Numbers and Breeding Success of Snowy Plovers and Least Terns in the Oceano Dunes District of California State Parks, San Luis Obispo, California. March 2009 Draft. Prepared for CDPR, OHMVR Division.

Page, G. W., and L.E. Stenzel. 1981. "The Breeding Status of the Snowy Plover in California." *Western Birds* 12: 1-40.

Page, G. W., J. C. Warriner, J. S. Warriner, C. Eyster, K. Neuman, S. Connors, R. DiGaudio, J. Erbes, and D. George. 2002. Nesting of the Snowy Plover in Monterey Bay and on the beaches of northern Santa Cruz County, California 2002. Publication Number 990, PRBO Conservation Science, Stinson Beach, California. November 2002.

Page, G. W., L. E. Stenzel, J. S. Warriner, J. C. Warriner, and P. W. Paton. 2009. Snowy Plover (*Charadrius nivosus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online. http://bna.birds.cornell.edu/bna/species/154.

Patrick, A. M., and M. A. Colwell. 2014. "Snowy Plovers Select Wide Beach for Nesting." *Wader Study Group Bulletin* 121: 17-20.

Patton, R. 2009. Email from Robert Patton to Livia Borak Following up on Airport California Least Tern Report in Summary of Substantial Evidence of Potentially Significant Wildlife Impacts from Fireworks Displays in the City of San Diego. Coast Law Group.

Pearson, S. F., C. Sundstrom, K. Gunther, D. Jaques, and K. Brennan. 2008. Snowy Plover Population Monitoring, Research, and Management Actions: 2008 Nesting Season Research Progress Report Washington Department of Fish and Wildlife, Wildlife Science Division, Olympia.

Pearson, S. F., S. M. Knapp, and C. Sundstrom. 2014. "Evaluating the Ecological and Behavioral Factors Influencing Snowy Plover *Charadrius nivosus* Egg Hatching and the Potential Benefits of Predator

Exclosures." *Bird Conservation International* on CJO2014 doi:10.1017/S0959270914000331: 1-19.

Pearson, S. H., H. W. Avery, and J. R. Spotila. 2015. "Juvenile invasive red-eared slider turtles negatively impact the growth of native turtles: Implications for global freshwater turtle populations." *Biological Conservation* 186: 115-121.

Pest Management Regulatory Agency. 2015. Glyphosate Proposed Re-evaluation Decision. Health Canada, Ottowa, Ontario.

Pienkowski, M. W. 1983. "Changes in the Foraging Patter of Plovers in Relation to Environmental Factors." *Animal Behavior* 31: 244-264.

Powell, A. N. 1996. Western Snowy Plover Use of State-Managed Lands in Southern California, 1995. CDFW Management Division, Bird and Mammal Conservation Program Rep 96-03, Sacramento, CA. 14 pp.

Powell, A. N., and F. J. Cuthbert. 1993. "Augmenting Small Populations of Plovers: An Assessment of Cross Fostering and Captive Rearing." *Conservation Biology* 7: 160-168.

Powell, A. N., F. J. Cuthbert, L. C. Wemmer, A. W. Doolittle, and S. T. Feirer. 1997. "Captive-rearing Piping Plovers: Developing Techniques to Augment Wild Populations." *Zoo Biology* 16: 461-477.

Reese, Devin A. 1996. *Comparative Demography and Habitat Use of Western Pond Turtles in Northern California: The Effects of Damming and Related Alterations.* Ph.D dissertation, University of California at Berkeley.

Regional Water Quality Control Board, C. C. R. 2013. Staff Report for Regular Meeting of May 30-31, 2013.

Rischbieter, Douglas. 2004. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve. California Department of Parks and Recreation, Central Valley District, Columbia, CA.

Rischbieter, Douglas. 2005. Aquatic Survey Arroyo Grande Creek and Lagoon - Oceano Dunes SVRA, Pismo State Beach Dunes Preserve. March 2, 2005. California Department of Parks and Recreation, Central Valley District, Columbia, CA.

Rischbieter, Douglas. 2006. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2005 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve. California Department of Parks and Recreation, Central Valley District, Columbia CA.

Rischbieter, Douglas. 2008. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2007 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve. California Department of Parks and Recreation, Central Valley District, Columbia, CA.

Rischbieter, Douglas. 2009a. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2008 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve. California Department of Parks and Recreation, Central Valley Dist., Columbia, CA.

Rischbieter, Douglas. 2009b. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2009 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes

State Reserve. California Department of Parks and Recreation, Central Valley District, Columbia, CA.

Rischbieter, Douglas. 2010. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2010 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve. California Department of Parks and Recreation, Central Valley Dist., Columbia, CA.

Rischbieter, Douglas. 2011. Lower Arroyo Crande Creek and Lagoon Fishery and Aquatic Resources Summary 2011 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve.

Rischbieter, Douglas. 2012. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2012 Monitoring Report, Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve.

Rischbieter, Douglas. 2013. Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary 2013 Monitoring Report. Oceano Dunes State Vehicular Recreation Area, Pismo Dunes Natural Preserve.

Rischbieter, Douglas. 2014. Arroyo Grande Lagoon and Adjacent Waters, Fishery and Aquatic Resources Summary 2014 Monitoring Report, Oceano Dunes SVRA, Pismo Dunes Natural Preserve.

Rischbieter, Douglas. 2015. Arroyo Grande Lagoon Adjacent Waters, Fishery and Aquatic Resources Summary 2015 Monitoring Report, Oceano Dunes SVRA, Pismo Dunes Natural Preserve.

Rischbieter, Douglas. 2016. Aquatic Survey Arroyo Grande Creek and Lagoon, Oceano Dunes SVRA, Pismo State Beach Dunes Preserve.

Rischbieter, Douglas. 2017. Arroyo Grande Lagoon and Adjacent Waters Fishery and Aquatic Resources Summary 2017 Monitoring Report Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve.

Rischbieter, Douglas. 2018. Arroyo Grande Lagoon and Adjacent Waters Fishery and Aquatic Resources Summary 2018 Monitoring Report Oceano Dunes State Vehicular Recreation Area, Pismo Dunes State Reserve.

Rischbieter, Douglas. 2020a. CDPR. Arroyo Grande Lagoon and Adjacent Waters Fishery and Aquatic Resources Summary 2019 Monitoring Report. Oceano Dunes State Vehicular Recreation Area, Pismo Dunes Natural Preserve.

Rischbieter, Douglas. 2020b. Aquatic Survey Reports (Reference Permit #TE-101154-3) Arroyo Grande, Pismo, and Carpenter Creek Lagoons Pismo State Beach. Reports documenting surveys conducted in April, June, September, and November 2020.

Rischbieter, Douglas. 2021. Aquatic Survey Reports (Reference Permit #TE-101154-3) Arroyo Grande, Pismo, and Carpenter Creek Lagoons Pismo State Beach; Oceano Dunes State Vehicular Recreation Area. Reports documenting surveys conducted in February, June, and October 2021.

Rischbieter, Douglas. 2022. Aquatic Survey Reports (Reference Permit #TE-101154-3) Arroyo Grande, Pismo, and Carpenter Creek Lagoons Pismo State Beach; Oceano Dunes State Vehicular Recreation Area. Reports documenting surveys conducted in February, June, and December 2022.

Rischbieter, Douglas. 2023. Aquatic Survey Reports (Reference Permit #TE-101154-3) Arroyo Grande, Pismo, and Carpenter Creek Lagoons Pismo State Beach; Oceano Dunes State Vehicular Recreation Area. Reports documenting surveys conducted in February, May, August, and November 2023.

Rischbieter, Douglas. 2024a. Aquatic Survey Reports (Reference Permit #TE-101154-3) Arroyo Grande, Pismo, Carpenter, and Oso Flaco Lagoons Pismo State Beach; Oceano Dunes State Vehicular Recreation Area. Reports documenting surveys conducted in February, May, August, and October 2024.

Rischbieter, Douglas, pers. comm. 2007. October 2. September 17th Survey of Arroyo Grande Creek/Lagoon. Email communication.

Rischbieter, Douglas, pers. comm. 2011a. March 28, 2011 Summary Results – Tidewater Goby Surveys in Arroyo Grande and Pismo Creek. Email communication.

Rischbieter, Douglas, pers. comm. 2011b. July 13, 2011 Summary Results – Tidewater Goby Surveys in Arroyo Grande and Pismo Creek. Email communication.

Rischbieter, Douglas, pers. comm. 2011c. August 8. Telephone Conversation with Rischbieter, Doug. Environmental Scientist, California State Parks.

Rischbieter, Douglas, pers. comm. 2012. September 6. Tidewater Goby – 4 San Luis Obispo County Locations, April 2012 (Rischbieter TE-101154-1) Email communication.

Rischbieter, Douglas, pers. comm. 2017. 3 Noteworthy Tidewater Goby Collections: S.L.O. County Distribution Expansion (TE 101154-2). Email communication.

Rischbieter, Douglas, pers. comm. 2024. 2024 review of Draft HCP.

Roche, E. A., F. J. Cuthbert, and T. W. Arnold. 2008. Relative Fitness of Wild and Captive-reared Piping Plovers: Does Egg Salvage Contribute to Recovery of the Endangered Great Lakes Population? Biological Conservation 141: 3079-3088.

Roche, E. A., T. W. Arnold, J. H. Studker, and F. J. Cuthbert. 2010. “Colored Plastic and Metal Leg Bands do not Affect Survival of Piping Plover Chicks.” *Journal of Field Ornithology 81: 317-324.*

Roddick, Lindsey, and Dena Paolilli. 2022. *Year 4 Update Evaluating Effectiveness of Nipomo Lupine Recovery Management.* The Land Conservancy of San Luis Obispo.

Rodgers, J. A., and H. T. Smith. 1995. “Set back Distances to Protect Nesting Bird Colonies from Human Disturbance in Florida.” *Conservation Biology* 9: 89-99.

Rose, Jonathan, Brian Halstead, and Robert Fisher. 2020. "Integrating multiple data sources and multi-scale land-cover data to model the distribution of a declining amphibian." *Biological Conservation 241.* https://doi.org/10.1016/j.biocon.2019.108374.

Rose, Jonathan, Brian Halstead, Robert Packard, and Robert Fisher. 2022. "Projecting the remaining habitat for the western spadefoot (Spea hammondii) in heavily urbanized southern California." *Global Ecology and Conservation 33.* https://doi.org/10.1016/j.gecco.2021.e01944.

Ruhlen, T. D., L. E. Abbott, and G. W. Page. 2003. "Evidence that Human Disturbance Reduces Snowy Plover Chick Survival." *Journal of Field Ornithology* 74: 300-304.

Rutherford, C., pers. comm. 2016. HCP rare plants.

Samantha Alvarez Coastal SL RCD. 2024. "Phone communication with Ben Wagner on January 25, 2024."

Sawyer, J. O., T. Keeler-Wolf, and J. Evans. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society in Collaboration with California Department of Fish and Game, Sacramento.

Schneider, Julie. 2000. *Oso Flaco Lake Boardwalk Project California Red-Legged Frog Survey Report. March 14, 2000.* Cambria, CA: Small Planet Environmental Consulting Institute.

Seeliger, L.M. 1945. "Variation in the Pacific Mud Turtle." *Copeia* (American Society of Ichthyologists and Herpetologists) 1945 (3): 150-159. https://doi.org/10.2307/1438278.

Syracuse Environmental Research Associates [SERA]. 2001. Sethoxydim (Poast) Human Health and Ecological Risk Assessment Final Report. Submitted to USDA Forest Service. Forest Health Protection Staff, Arlington, VA.

SERA. 2004. Chlorsulruon Human Health and Ecological Risk Assessment Final Report. Submitted to USDA Forest Service. Forest Health Protection Staff, Arlington, VA.

SERA. 2007. Aminopyralid Human Health and Ecological Risk Assessment Final Report. Submitted to USDA/Forest Service and National Park Service, Southern Region, Atlanta, GA.

SERA. 2011a. Glyphosate Human Health and Ecological Risk Assessment Final Report. Submitted to USDA Forest Service, Southern Region. Atlanta, GA.

SERA. 2011a. Glyphosate Hunman Health and Ecological Risk Assessment Final Report. Submitted to USDA Forest Service, Southern Region, Atlanta, GA.

SERA. 2011b. Imazapyr Human Health and Ecological Risk Assessment Final Report. Submitted to USDA Forest Service, Southern Region, Atlanta, GA.

SERA. 2012. Aminocyclopyracholo Human Health and Ecological Risk Assessment Final Report Submitted to USDA Forest Service. Forest Health Technology Enterprise Team, Morgantown, WV.

SERA. 2014. Scoping/Screening Level Risk Assessment on Clethodim: Final Report. Submitted to USDA Forest Service. Forest Health Technology Enterprise Team.

Shaffer, Brad; Peter Scott, Zachary Devereaux, Hogan Fenster, Stephanie Manzo, Thomas Morgan, Griffin Nicholson, Delacey Rodriguez, and Bianca Sanchez. 2019. *Assessment for the Western Pond Turtle Final Report*. University of California, Los Angeles. Client: U.S. Fish & Wildlife Service

Sin, Hans. 2021. *CDFW, Nongame Wildlife Program.* California Least Tern Breeding Survey 2017 Season.

Sin, Hans, Corey Clatterbuck, and Kyle Rice. 2024. CDFW, Wildlife Branch. California Least Tern Breeding Survey 2018-19 Season Final Report, February 8, 2024.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company, Vista, CA.

Spies, Brenton T, and David K Jacobs. 2022. "Metapopulation Status of the Tidewater Gobies: A Federally Endangered California Coastal Endemic Fish Genus (Eucyclogobius)." In *A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Biology*.

Spinks, Phillip Q., Robert C. Thomson, and H. Bradley Shaffer. 2014. "The advantages of going large: genome-wide SNPs clarify the complex population history and systematics of the threatened western pond turtle." *Molecular Ecology* 23: 2228–2241. doi:10.1111/mec.12736.

Staine, K. J., and J. Burger. 1994. Nocturnal Foraging Behavior of Breeding Piping Plovers (*Charadrius melodus*) in New Jersey. The Auk 111: 579-587.

State Water Resources Control Board. 2010. 2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report. California Environmental Protection Agency Report.

State Water Resources Control Board. 2014. Approving an Amendment to the Water Quality Control Plan for the Central Coastal Basin to Adopt Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate in the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake.

Stebbins, R. C., and S. M. McGinnis. 2012. *Field guide to amphibians and reptiles of California: revised edition.* University of California Press.

Stenzel, L. E., S. C. Peaslee, and G. W. Page. 1981. "The Breeding Status of the Snowy Plover in California. II. Mainland Coast." *Western Birds* 12: 6-16.

Stratton, Lisa, pers. comm. 2022. Nipomo Mesa lupin data, 2022. Reported in emailed spreadsheet by Lisa Stratton (CCBER-UCSB) to Ben Wagner (CDPR), Oct 3, 2023.

Stratton, Lisa, pers. comm. 2023. Email to Ben Wagner re: Outplanting Field Experiment for Lupinus Nipomensis Year 8 At Black Lake Ecological Area, LCSLO. Prepared by Lisa Stratton & Justin Luong, Cheadle Center for Biodiversity and Ecological Restoration, Prepared for: USFWS.

Stratton, Lisa, Ryan Lippitt, and Wayne Chapman. 2020. *Assessing the impact of Clethodim on the Vigor, Seed Production and Seed Viability of the Endangered Lupinus nipomensis.* Cheadle Center for Biological Diversity and Ecological Restoration (CCBER) at U.C. Santa Barbara.

Sutter, Michael. 2018. Rangewide Tidewater Goby Occupancy Survey Using Environmental DNA. A Thesis Presented to The Faculty of Humboldt State University In Partial Fulfillment of the Requirements for the Degree Master of Science in Natural Resources: Fisheries.

SWCA Environmental Consultants. 2012. Revised Final Grover Beach Lodge and Conference Center Environmental Impact Report.

Swedish Chemicals Agency. 2015. Product Assessment Report VectoBac G and VectoBac GR. Re-authorization.

Swift, C, Brenton Spies, Ryan A Ellingson, and David K Jacobs. 2016. "A New Species of the Bay Goby Genus Eucyclogobius, Endemic to Southern California: Evolution, Conservation, and Decline. A New Species of the Bay Goby Genus *Eucyclogobius*, Endemic to Southern California: Evolution, Conservation, and Decline." *PLoS ONE* 11(7): e0158543. doi:10.1371/journal.pone.0158543.

Swift, C., J. L. Nelson, C. Maslow, and T. Stein. 1989. "Biology and Distribution of the Tidewater Goby, Eucyclogobius newberryi (Pisces: Gobiidae) of California." *Contributions in Science, 404: 1-19* (Natural History Museum of Los Angeles County).

Swift, C., J. Mulder, C. Dellith, and K. Kettleson. 2018. "Mortality of Native and Non-native Fishes during Artificial Breaching of Coastal Lagoons in Southern and Central California." *Bulletin of Southern California Academy of Sciences* 117: 157-168.

Swift, C., pers. comm. 2008. February 8. Summary of Surveys for Tidewater Goby. Email communication.

Tatum, V. L. 2004. "Toxicity, transport, and fate of forest herbicides." *Wildlife Society Bulletin* 32: 1042-1048.

Terra Verde Environmental Consulting. 2012. Biological Resources Assessment, Meadow Creek Lagoon. Prepared for San Luis Obispo County Flood Control and Water Conservation District.

Thompson., B. C., J. A. Jackson, J. Burger, L. A. Hill, E. M. Kirsch, and J. L. Atwood. 1997. Least Tern (Sternula-antillarum), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. http://bna.birds.cornell.edu/bna/species/290/articles/breeding.

Thomson, Robert, Amber Wright, and H. Bradley Shaffer. 2016. *California Amphibian and Reptile Species of Special Concern.* University of California Press.

U.S. Fish and Wildlife Service [USFWS]. 1985. Recovery Plan for the California Least Tern, *Sterna antillarum browni*. U.S. Fish and Wildlife Services, Portland, Oregon 112 pages.

USFWS. 1988. Red Fox Removal Program at Seal Beach National Wildlife Refuge, U. S. Naval Weapons Station.

USFWS. 1993. Endangered and Threatened Wildlife and Plants; Determination for Two Plants, *Arenaria Paludicola* (Marsh Sandwort) and *Rorippa Gambellii* (Gambel's Watercress). Federal Register 58(147): 41378-41384.

USFWS. 1994. Endangered and threatened wildlife and plants; determination of endangered status for the tidewater goby. 59 Fed. Reg. 5494.

USFWS. 1996. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-Legged Frog. Federal Register 61(101): 25813-25833.

USFWS. 1998. Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Rorippa-gambelii*). U.S. Fish and Wildlife Service, Portland, Oregon, 50 pp. + appendices.

USFWS. 2000a. Draft Recovery Plan for the California Red-Legged Frog (Rana *aurora draytonii*). Portland, Oregon.

USFWS. 2000b. Endangered and Threatened Wildlife and Plants; Final Rule for Endangered Status for Four Plants from South Central Coastal California; Final Rule. 65 Fed. Reg. 14888.

USFWS. 2001a. Endangered and Threatened Wildlife and Plants; Final Determinations of Critical Habitat for the California Red-Legged Frog; Final Rule. 65 Fed. Reg. 14626.

USFWS. 2001b. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Cirsium loncholepis* (La Graciosa Thistle), *Eriodictyon capitatum* (Lompoc Yerba Santa), and *Deinandra increscens* ssp. *villosa* (Gaviota Tarplant). Federal Register 66(221):57560-57600.

USFWS. 2002. Recovery Plan for the California Red-Legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregan. viii + 173 pp.

USFWS. 2005a. Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*), U.S. Fish and Wildlife Service, Portland, Oregon. vi +199 pp.

USFWS. 2005b. Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog.

USFWS. 2006 California Least Tern (*Sternula antillarum browni*) 5-Year Review Summary and Evaluation. U. S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California. September 2006.

USFWS. 2007a. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). In 2 volumes. Sacramento, California. xiv + 751 pages.

USFWS. 2007b. Tidewater Goby (*Eucyclogobius newberryi*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura, California.

USFWS. 2007c. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). In 2 volumes. Sacramento, California. xiv + 751 pages.

USFWS. 2008a. *Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Tidewater Goby (Eucyclogobius newberryi); Final Rule.* 73(21):5920-6006.

USFWS. 2008b. *Arenaria paludicola* (Marsh Sandwort) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura California.

USFWS. 2008c. "Draft Recovery Outline for *Cirsium loncholepis* (La Graciosa Thistle)"

USFWS. 2009a. U.S. Fish and Wildlife Service - Spotlight Species Action Plan 2010-2014. California Least Tern. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office.

USFWS. 2009b. *Lupinus nipomensis* (Nipomo Lupine) 5-year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, CA.

USFWS. 2009c. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for *Cirsium loncholepis* (La Graciosa Thistle); Final Rule. 74 Fed. Reg. 56978.

USFWS. 2009d. Spotlight Species Action Plan 2010-2014. Gambel's Watercress U.S. Fish and Wildlife Service.

USFWS. 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the California Red-Legged Frog. 75 Fed. Reg. 12816.

USFWS. 2011a. *Rorippa gambellii* [*Nasturtium gambelii*] (Gambel's watercress) 5-Year Review: Summary and Evaluation. Ventura Fish and Wildlife Office, Ventura, California.

USFWS. 2011b. *Cirsium loncholepis* [*Cirsium scariosum* var. *loncholepis*] (La Graciosa thistle) 5-Year Review: Summary and Evaluation. Ventura Fish and Wildlife Office, Ventura, California.

USFWS. 2011c. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Proposed Rule. 76 Fed. Reg. 16046.

USFWS. 2012. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. 77 Federal Register: 36728-36869.

USFWS. 2013. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Tidewater Goby; Final Rule.. 78 Fed. Reg. 8746.

USFWS. 2014. Endangered and Threatened Wildlife and Plants; Reclassifying the Tidewater Goby from Endangered to Threatened; Proposed Rule and 12-month Finding. 79 Fed. Reg. 14340.

USFWS. 2016. Guadalupe-Nipomo Dunes National Wildlife Refuge Final Comprehensive Conservation Plan. Sacramento, CA.

USFWS. 2017. 2016-2017 Winter Rangewide Western Snowy Plover Survey.

USFWS. 2018. Guidance on Trigger for an Incidental Take Permit under Section 10(a)(1)(B) of the Endangered Species Act Where Occupied Habitat or Potentially Occupied Habitat is Being Modified.

USFWS. 2019a. *La Graciosa Thistle (Cirsium scariosum var. loncholepis) 5-Year Review: Summary and Evaluation.* Ventura: USFWS, Ventura Fish and Wildlife Office.

USFWS. 2019b. *Nipomo Mesa Lupine (Lupinus nipomensis) 5-Year Review: Summary and Evaluation.* Ventura: USFWS Ventura Field Office.

USFWS. 2019c. *Recovery Plan for Marsh Sandwort (Arenaria paludicolu) and Gambel's Watercress (Rorippa gambelii) Amendment 1.* USFWS, Pacific Southwest Region, Ventura, CA. September 2019.

USFWS. 2020a. "California Least Tern (*Sterna antillarum browni*) (= *Sterna a.b.*) Five-Year Review: Summary and Evaluation."

USFWS. 2020b. 2020 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast.

USFWS. 2020c. *Marsh sandwort (Arenaria paludicola) 5-Year Review: Summary and Evaluation.* Ventura Fish and Wildlife Office, August 2020.

USFWS. 2021. 2021 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast.

USFWS. 2022a. "2022 Winter Window Survey for Snowy Plovers on U.S. Pacific Coast."

USFWS. 2022b. *Gambel's Watercress (Nasturtium gambelii [Rorippa gambellii]) 5-Year Review: Evaluation and Summary.* Ventura: USFWS, Ventura Fish and Wildlife Office.

USFWS. 2023a. "Species status assessment report for the northwestern pond turtle (*Actinemys marmorata*) and southwestern pond turtle (*Actinemys pallida*), Version 1.1, April 2023."

USFWS. 2023b. Species Status Assessment Report for the Western Spadefoot (Spea hammondii), Version 1.1. May 2023.

USFWS. 2023c. *Endangered and Threatened Wildlife and Plants; Threatened Species Status With Section 4(d) Rule for the Northwestern Pond Turtle and Southwestern Pond Turtle.* 88 Fed. Register 190, pages 68370-68399.

USFWS. 2023d. Endangered and Threatened Wildlife and Plants: Threatened Status With Section 4(d) Rule for the Northern and Southern Distinct Population Segments of the Western Spadefoot. 88 Fed. Reg. 84252-84278.

USFWS. 2023e. Endangered Species Act Compensatory Mitigation Policy. Appendix 1, 501 FW 3, May 2023.

USFWS. 2023f. 2023 [Snowy Plover] Winter window survey.

USFWS and NOAA Fisheries. 2016. *Habitat Conservation Planning and Incidental Take Permit Processing Handbook.* Dept. of the Interior.

U.S. Geological Survey [USGS]. 1998. *Western Ecological Research Center Piedras Blancas Field Station. Summary Report for Oso Flaco Lake. September 8, 1998.* U.S. Geological Survey Biological Resources Division.

USGS. 2006a. *USGS Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion (Draft).* USGS, Western Ecological Research Center.

USGS. 2006b. *USGS Western Pond Turtle (Emys marmorata) Trapping Survey Protocol for the Southcoast Ecoregion. Survey Protocol, version 1.* USGS, Western Ecological Research Center.

USGS. 2006c. *USGS Protocol for Nocturnal Aquatic Species of South Coast Ecoregion Rivers, Streams, and Creeks. Survey Protocol, version 1.* USGS, Western Ecological Research Center.

USGS. 2013. "National Hydrography Dataset (NHD) for San Luis Obispo County, California." The National Map.

Vas, E., A. Lescroel, O. Duriez, G. Boguszewski, and D. Gremillet. 2015. Approaching Birds with Drones: First Experiments and Ethical Guidelines. Biological Letters 11.

Vincent, K., and C. Davidson. 2015. The Toxicity of Glyphosate Alone and Glyphosate -Surfactant Mixtures to Western Toad (*Anaxyrus boreas*) Tadpoles. Environmental Toxicology and Chemistry 34: 2791-2795.

Wagner, Ben, pers. comm. 2024. Comments on Draft HCP covered plant occurrence data.

Wagner, S. D. 2015. Study 302: Mitigation of Pesticide Runoff Using a Bioreactor in Santa Maria Valley. Department of Pesticide Regulation.

Walters, D. R., and B. K. Walters. 1988. Taxonomy, Demography, and Ecology of Lupinus nipomensis. Eastwood.

Warriner, J. S., J. C. Warriner, G. W. Page, and L.E. Stenzel. 1986. "Mating System and Reproductive Success of a Small Population of Polygamous Snowy Plovers." *Wilson Bulletin* 98: 15-37.

Washington Department of Agriculture. 2017. Imazapyr Fact Sheet.

Waterways Consulting, Inc. 2010. Arroyo Grande Creek Channel Waterway Management Program Prepared for San Luis Obispo County Flood Control and Water Conservation District Zones 1 and 1A Flood Control District.

Watts, C. M., J. Cao, C. Panza, C. Dugaw, M. A. Colwell, and E. Burroughs. 2012. "Modeling the Effects of Predator Exclosures on a Western Snowy Plover Population." *Natural Resource Modeling* 26: 529-547.

Webber, A. F., J. A. Heath, and R. A. Fischer. 2013. "Human Disturbance and Stage-specific Habitat Requirements Influence Snowy Plover Site Occupancy During the Breeding Season." *Ecology and Evolution* 3:853-863.

White, J. A. 2007. Recommended protection Measures for Pesticide Applications in Region 2. U. S. Fish and Wildlife Service, Environmental Contaminants Program, Austin, TX.

Wiedemann, A. M. 1984. The Ecology of Pacific Northwest Coastal Sand Dunes: A Community Profile. U.S. Fish and Wildlife Service, Washington, D.C.

Wilbur-Ellis. 2016a. Competitor. Safety Data Sheet.

Wilbur-Ellis. 2016b. Renegade EA Safety Data Sheet.

Wilson, C. A., and M. A. Colwell. 2010. "Movements and Fledging Success of Snowy Plover (*Charadrius alexandrinus*) Chicks." *Waterbirds* 33: 331-340.

Wilson, Joshua, Tatsuya Amano, and Richard Fuller. 2023. "Drone-induced flight initiation distances for shorebirds in mixed-species flocks." *Journal of Applied Ecology* (John Wiley & Sons Ltd on behalf of British Ecological Society) 60: 1816-1827. doi:10.1111/1365-2664.14467.

Wilson-Jacobs, R., and E. C. Meslow. 1984. “Distribution, abundance, and nesting characteristics of Snowy Plovers on the Oregon coast.” *Northwest Science* 58: 40-48.

Worcester, K. R. 1992. Habitat utilization in a central California coastal lagoon by the tidewater goby (Eucyclogobius newberryi). Master's thesis, California Polytechnic University, San Luis Obispo.

Worcester, K. R., and R. N. Lea. 1996. Observations on tidewater goby habitat utilization and laboratory maintenance during the California drought. Unpublished abstract from Sysposium on tidewater goby, Southern California Academy of Sciences Annual Meeting at Loyola Marymount University May 3-4, 1996.

Zitt, B. 2017. California red-legged frog (*Rana draytonii*) habitat assessment; Pismo State Beach Lagoon Trail improvements project 2017-04-14.

Personal Communications (not otherwise listed in Bibliography)

C. Cleveland, pers. comm. 2014, October 22. California Red-legged Frog in the Oceano Dunes SVRA and Pismo State Beach. Email communication.

C. Cleveland, pers. comm. 2019. California Red-legged Frog in the Oceano Dunes SVRA and Pismo State Beach. Email communication.

J. Iwanicha, pers. comm. 2024. CLTE chicks fledged.

M. Skinner, pers. comm. 2017. Rare Plant Surveys at Oceano Dunes SVRA.

This page intentionally left blank.