USFWS Consultation Supplement for the Wildlife Damage Management Project

January 2024

United States Department of the Interior

FISH AND WILDLIFE SERVICE
2800 Cottage Way, W-2606
Sacramento, CA 95825

In Reply Refer to:
FWS/R8/AES

Mr. Dennis Orthmeyer
State Director, California Office
U.S. Department of Agriculture
Animal and Plant Health Inspection Services, Wildlife Services
3419A Arden Way
Sacramento, CA 95825

Dear Mr. Orthmeyer:

This is in response to your April 18, 2023 request for confirmation of the validity of informal consultations regarding integrated wildlife damage management activities in California to protect livestock, property, human health and safety, and natural resources.

We previously concurred with your determination that these activities were not likely to adversely affect certain listed species. The rationales for our concurrences are contained in our letters dated May 8, 2007, April 15, 2004, and December 25, 2015. We acknowledge and appreciate your confirmation that no adverse effects, including incidental take, of federally-listed species has been detected or is otherwise known to have occurred in the course of implementation of the program since these consultations were completed. You have determined that there is no new information that would change the effects determinations that were the subject of these previous consultations, except for the gray wolf. The changes to the gray wolf range and population in California have been addressed in a consultation completed in 2020 (08EKLA00- 2020-F-0072). In addition, several other Section 7 consultations have been completed or are in progress to address impacts of wildlife damage management activities on listed species, including: coastal threatened and endangered species, desert tortoise, Sierra Nevada bighorn sheep, Sierra Nevada red fox, and activities on airfields in California.

We are not aware of any new information that would suggest effects that were not previously considered; therefore, we confirm that our concurrences remain in effect and reinitiation of consultation is not necessary at this time.

Sincerely,

MICHAEL SENN

Digitally signed by MICHAEL SENN
Date: 2023.06.09 16:05:22 -07'00'

Michael Senn
Assistant Regional Director
Ecological Services

cc:
FWS Region 8, All ES Office Field Supervisors

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer to:
FWS-SD-22-0070548-S7-I

December 16, 2022
Sent Electronically

Dennis Orthmeyer
State Director – Wildlife Services
Marketing and Regulatory Programs
U.S. Department of Agriculture
3419A Arden Way
Sacramento, California 95825

Subject: Informal Section 7 Consultation for Wildlife Services California Wildlife Damage Management at Airfields in California

Dear Dennis Orthmeyer:

This letter is in response to the U.S. Department of Agriculture (USDA), Wildlife Services-California (Wildlife Services) letter requesting our concurrence pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*), that ongoing implementation of wildlife damage management activities at supported airfields in California (Project), as described in *Biological Assessment: Wildlife Damage Management on Airfields in California* (biological assessment; Wildlife Services 2021) is not likely to adversely affect endangered and threatened species considered on supported airfields in California (Table 1). We received your request on June 14, 2021. The Project Area includes the operational area [aircraft movement areas, aircraft parking areas, loading ramps, safety areas, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures] and 200 feet surrounding each airfield (Tables 3 and 4). The Project does not address emergency situations, which may arise if wildlife presence results in immediately foreseeable risk to human life. In such an emergency, Wildlife Services will immediately take appropriate action to protect human life and property and, if needed, will coordinate with the U.S. Fish and Wildlife Service (Service) using the attached Emergency Consultation Form (Appendix A).

On July 5, 2022, the U.S. District Court of the Northern District Court of California vacated the 2019 regulations implementing section 7 of the Act. On September 21, 2022, the Ninth Circuit Court of Appeals granted a request to stay the U.S. District Court of Northern California's July 5, 2022, order that vacated the 2019 regulations. On November 14, 2022, the U.S. District Court of the Northern District Court of California remanded without *vacatur* the 2019 regulations. As a result, the 2019 regulations are again in effect, and the Service has relied upon the 2019 regulations in issuing our written concurrence on the action agency's "may affect, not-likely-to-adversely-affect" determination. However, because the outcome of the legal challenges to the 2019 regulations is still unknown, we considered whether our substantive analyses and conclusions would have been different if the pre-2019 regulations were applied in this informal consultation. Our analysis included the prior definition of "effects of the action." We considered all the "direct and indirect effects" and the "interrelated and interdependent activities" when determining the "effects of the action." We then considered whether any "effects of the action" that overlap with applicable ranges of listed species would be wholly beneficial, insignificant, or discountable to the species. As a result, we determined the substantive analysis and conclusions would have been the same, irrespective of which regulations applied.

Wildlife Services determined that the Project will have no effect on 153 listed species (Appendix B) that could occur in the vicinity of supported airfields because:

1. Wildlife Services field personnel on airports do not: perform construction activities; significantly disturb soil; or remove, cut, or destroy vegetation.

2. Wildlife Services field personnel on airports travel by vehicle on existing roads and conduct trapping activities in previously disturbed areas on airfields.

3. Wildlife Services field personnel coordinate with environmental staff at airports to identify sensitive areas to avoid.

Based on Wildlife Services' determination, the species identified in Appendix B are not considered further in this consultation. In addition, based on Service review and internal coordination, several species assessed in the biological assessment are unlikely to occur in the Project area. These species: the Alameda whipsnake (*Masticophis lateralis euryxanthus)*, California condor (*Gymnogyps californianus*), giant kangaroo rat (*Dipodomys ingens*), and Yuma Ridgway's rail (*Rallus obsoletus yumanensis*) are not likely to be adversely affected by the Project because they are unlikely to occur in the Project area. These species are not considered further in this consultation.

Wildlife Services evaluated the potential effects of wildlife management techniques potentially used on airfields (Appendix C) and determined that a subset of the available management techniques (Appendix D) would have no effect on listed species due to targeted deployment, infrequency of use, or trap type. Based on Wildlife Services determination, activities identified in Appendix D are not evaluated further in this consultation.

Table 1. Listed species considered at one or more airfields in Project Area.

Species' Common Name	**Species' Scientific Name**
California clapper rail[1]	*Rallus longirostris obsoletus*
Coastal California gnatcatcher[1]	*Polioptila californica californica*; gnatcatcher
California least tern[1]	*Sternula antillarum browni*
least Bell's vireo[1]	*Vireo belli pusillus*

Species' Common Name	Species' Scientific Name
light-footed Ridgway's (=clapper) rail[1]	*Rallus obsoletus (=longirostris) levipes*
San Clemente Bell's sparrow[1] = San Clemente sage sparrow	*Artemisiospiza belli clementeae (= Amphispiza belli clementeae*
San Clemente loggerhead shrike[1]	*Lanius ludovicianus mearnsi*
southwestern willow flycatcher[1]	*Empidonax traillii extimus*
Western snowy plover[1] [Pacific Coast population Distinct Population Segment (DPS)]	*Charadrius nivosus nivosus (C. alexandrinus n.)*
Yellow-billed cuckoo[1] (western DPS)	*Coccyzus americanus*
Fresno kangaroo rat[2]	*Dipodomys nitratoides exilis*
Salt marsh harvest mouse[2]	*Reithrodontomys raviventris*
San Bernardino Merriam's kangaroo rat[2]	*Dipodomys merriami parvus*
San Joaquin kit fox[2]	*Vulpes macrotis mutica*
Stephens' kangaroo rat[2]	*Dipodomys stephensi*
Tipton kangaroo rat[2]	*Dipodomys nitratoides nitratoides*
blunt-nosed leopard lizard[3]	*Gambelia silus*
California red-legged frog[3]	*Rana draytonii*
California tiger salamander[3]	*Ambystoma californiense*
desert tortoise[3] (Mojave population DPS)	*Gopherus agassizii*
giant garter snake[3]	*Thamnophis gigas*

[1] Federally threatened or endangered birds.
[2] Federally threatened or endangered mammals.
[3] Federally threatened or endangered reptiles and amphibians.

The Project includes wildlife management actions implemented by Wildlife Services personnel to reduce the potential for collisions or other interactions between aircraft and wildlife at supported airfields in California. Trained Wildlife Services personnel are assigned to specific airfield(s) on a full- or part-time basis or may be called on as needed to assess the risk of interaction between wildlife and aircraft. Wildlife Services personnel use a decision model to develop a site-specific management strategy for each airfield (Slate *et al*. 1992; Wildlife Services 2009) that includes a combination of safe, effective, and practical methods to reduce wildlife conflicts. Wildlife management to achieve Project objectives includes a wide variety of techniques that can be generally categorized as hazing,[1] trapping,[2] or lethally removing[3] target animals from the taxiways, runways, or adjacent areas as described in the biological assessment

[1] Hazing includes efforts to deter animals from roosting or frequenting active airfield areas. Popper shells, audio deterrents, and visual deterrents are used for hazing.
[2] Trap types used on airfields include: snare traps, various cage traps, various net traps intended to capture a live animal. After trapping, individuals may be released off site with appropriate permits, or humanely euthanized.
[3] Lethal removal may include the use of toxins, firearms, post-trapping euthanasia to permanently remove wildlife.

(Wildlife Services 2021). Many wildlife management techniques that may be used to implement the Project (Table 2; Appendix D) are used only infrequently or rarely. Techniques that are commonly used on one or more of the supported airfields in California that may affect listed species include several deterrent techniques (audio distress/predator calls, pyrotechnics), live capture (Bal Chatri traps, cage traps, decoy traps, pole/Verbail traps), and lethal removal (shooting).

Target animals include individuals that pose a risk to aircraft due to collision, ingestion (into engine), or runway/taxiway damage. Listed species will not be targeted for trapping or lethal removal except in emergency situations. Project-related activities occur on or adjacent to the runways and taxiways within the aircraft operations area, and vehicle travel is on existing maintained roads. The project does not include removal or modification of vegetation, digging, or surface disturbance of soils. The frequency of implementation of various techniques will vary and depend upon site-specific conditions, hazards to aircraft, and the identity and behavior of the targeted animal(s) that pose a risk to aircraft.

Wildlife Services evaluated the various types and anticipated frequency of wildlife management methods potentially used on airports in California and assessed the potential for each to affect listed species considered in this consultation. Activities in Table 2 are those that Wildlife Services determined may affect federally listed species; these activities are a subset of those identified in Appendix C.

Wildlife Services proposes to continue wildlife management to support safe airfields in the State of California indefinitely. The USDA Animal and Plant Health Inspection Service-Wildlife Services (APHIS-WS) has committed, as a component of their action, to meet with the Service annually to evaluate the effectiveness of conservation measures. To avoid the potential for adverse effects to listed species that may be present in habitat within or close to airfield boundaries, Wildlife Services will train staff and implement Conservation Measures as outlined below.

Table 2. Wildlife Management Techniques that May Affect Listed Species on Airfields in California[1,2]

Wildlife Management Technique	Anticipated Frequency of Use	Target Animal Group (Bird, Mammal)	Potential for Effect to Listed Species
Audio distress/predator calls	Common- daily	Both	NLAA
Working Dogs	Common-daily	Both	NLAA
Eye-spot balloons, flags, and Mylar®	Less Common	Both	NLAA
Lasers and lights	Less Common	Both	NLAA
Propane exploders/cannons	Seasonally	Both	NLAA
Pyrotechnics	Common- Daily	Both	NLAA
Scarecrows and effigies	Rare	Both	NLAA

Wildlife Management Technique	Anticipated Frequency of Use	Target Animal Group (Bird, Mammal)	Potential for Effect to Listed Species
Vehicles	Common- Daily	Both	NLAA
Radio controlled vehicles	Less common	Both	NLAA
Bal-chatri traps	Common- Daily	Birds-raptors	NLAA
Cage traps	Common- Daily	Both	NLAA
Decoy traps	Common- Daily	Birds	NLAA
Mist nets	Rare	Birds	NLAA
Padded-jaw foot-hold traps	Rare	Both	NLAA
Pole/Verbail traps	Common- Weekly	Birds-raptors	NLAA
Snap traps	Less common	Both	NLAA
Shooting	Common-Weekly	Both	NLAA
Body Grip (conibear; LAX, Moffett)	Seasonal-Common	Mammal	NLAA

[1] Description of methods are available in the Biological Assessment.
[2] Frequency categories [*denoted by color—definition obtained in email from Shannon Chandler* (*APHIS-WS*) *to Damian Higgins, August 28, 2018, based on 2007-2017 level of use*: Daily= 4+ days per week; Weekly=1+ days per week, 3 applications per month, and/or 50+ applications over 10 years; Less common=3 or fewer applications per month and 10-50 applications over 10 years; Rare=less than 10 applications over 10 years].

CONSERVATION MEASURES

Training and contribution to ongoing resource inventories

CM 1. Wildlife Services field personnel will be trained prior to working at airfields in California to ensure that they are familiar with the listed species that may inhabit the airfield and surrounding habitat, and the required conservation measures necessary to avoid the potential for adverse effects to these species. Existing Wildlife Services field personnel will be similarly trained within 6 months of finalization of this consultation. Field personnel will be required to sign a confirmation of training, and records that confirm completion of training will be maintained by Wildlife Services. Training will include an in-person or online live training by a qualified biologist with expertise about the species that inhabit the airfield and surrounding area. Training will also include a brochure, pamphlet, or webpage that includes:

a. A description and photographs of each listed species that may be present in, or within 500 feet of, the airfield boundary, including listed reptiles, amphibians, birds, mammals, plants, and invertebrates;

b. Maps outlining listed species habitat on, or within 500 feet of, the airfield boundary;

c. Pictures and descriptions of the listed species habitat(s) present in, or within 500 feet of, the airfield boundary;

d. Information regarding the species status and observations of the species on the airfield and surrounding habitat;

e. Species or airfield-specific conservation measures required to avoid and minimize potential for impacts to the listed species;

f. Maps and figures that depict buffer zones for use of radio-controlled vehicles, auditory deterrents, lasers, and traps;

g. General provisions of the Act and the requirement to adhere to the provisions of the Act; and

h. Contact information for the airfield environmental specialist or biologist(s), species specialists in the surrounding areas, and Service representatives.

CM 2. Wildlife Services field personnel will contribute to ongoing efforts to inventory and survey listed species at each airfield by actively searching for signs of listed species during routine Wildlife Services activities. Although Wildlife Services field personnel will not conduct protocol-driven listed species surveys, they will report incidental observations of the listed species to the local Service office and include details regarding observations in annual reports.

CM 3. Wildlife Services will submit a list that includes the name and contact information for field personnel stationed at each airfield to the local Service office and the installation/airfield biologist (or environmental specialist) on an annual basis.

Measures to reduce impacts from vehicle and pedestrian travel on airfields

CM 4. Wildlife Services personnel will: (a) maintain a 15-mph speed limit in the project area unless in pursuit of a target individual (Odell 2022; pers. comm.), (b) operate vehicles on existing maintained roads, and (c) park within developed areas or the footprint of existing access roads.

CM 5. Wildlife Services personnel will walk on existing runways, taxiways, trails, and roads when conducting management activities consistent with safety requirements.

CM 6. To the extent consistent with safety needs on the airfield, Wildlife Services will avoid night driving during or immediately after rain events to reduce the potential for vehicle impacts to amphibians.

CM 7. On airfields that could support desert tortoise, Wildlife Services field personnel will check under and adjacent to vehicles that have been parked prior to moving the vehicle. This includes the following airports: *China Lake Naval Air Station,* *Mojave Air and Space Port*. If a desert tortoise is found under a vehicle, that vehicle will not be moved until the tortoise has moved out from under the vehicle.

Buffers to avoid exposure of listed animal species to disturbance or direct impact

CM 8. Wildlife Services personnel will maintain a 200-foot buffer between radio-controlled vehicle use areas and habitat potentially occupied by listed species. Use of radio-controlled vehicles will be minimized during the avian breeding season at all airports that support listed avian species nesting habitat.

CM 9. Wildlife Services field personnel will restrict use of auditory deterrents to daylight hours and maintain a 200-foot buffer between auditory deterrents and listed avian species habitat during the avian breeding season, except in the instance of an emergency situation in which there is a perceived risk to aviation safety. The breeding season may vary between listed bird species, so each airfield considered will have specific requirements to address the listed bird species that may be present in the vicinity of the airfield.

CM 10. Wildlife Services field personnel will direct lasers away from listed bird and mammal species habitat if these tools are used to haze wildlife. Each airfield will identify listed bird and mammal species habitat in airfield-specific training materials (as per CM 1).

CM 11. Wildlife Services field personnel will maintain a minimum 200-foot buffer between traps and listed species habitat. Each airfield will identify listed species habitat in airfield-specific training materials (as per CM 1).

Special considerations for trap use at airports that support listed mammals, reptiles, and amphibians

CM 12. Wildlife Services will not use gas cartridges and snap traps at airports that may support listed mammals, reptiles, or amphibians without further coordination with the Service. This includes the following airports: *Edwards Air Force Base, French Valley Airport, Hemet-Ryan Airport, Lemoore Naval Air Station, March Air Force Base, Metropolitan Oakland International Airport, Moffett Federal Airfield, Ontario International Airport, San Bernardino International Airport, Bakersfield Municipal Airport, Byron Airport, Meadows Field Airport, Ramona Airport, San Bernardino International Airport, Travis Airforce Base, Vandenburg Airforce Base, Camp Roberts East Garrison, McMillan Army Airfield, China Lake Naval Air Station, Kingdon Airpark, Mojave Air and Space Port, Monterey Regional Airport, Napa County Airport, and Stockton Metropolitan Airport.*

CM 13. Wildlife Services personnel will not use neck/body snares or padded leghold traps at the following airports, where San Joaquin kit fox could be present, without further coordination with the Service: *Bakersfield Municipal Airport, Byron*

Airport, Camp Roberts East Garrison, McMillan Army Airfield, and Meadows Field Airport.

CM 14. At Lemoore Naval Air Station, where padded leghold traps may periodically be necessary to exclude coyotes from the airfield, Wildlife Services will increase pan tension to ensure that the traps exclude San Joaquin kit fox and ensure that trapping is conducted at least 200 feet from San Joaquin kit fox habitat.

CM 15. Wildlife Services will coordinate with the Service if cage trapping is deemed necessary at airports where San Joaquin kit fox could be present and will limit any necessary cage trapping to the months of September–January (i.e., outside natal season) to reduce the potential for capture of a San Joaquin kit fox. This includes the following airports: *Bakersfield Municipal Airport, Byron Airport, Camp Roberts East Garrison, Lemoore Naval Air Station, McMillan Army Airfield, and Meadows Field Airport*.

CM 16. If cage traps are used, Wildlife Services will conduct trap checks at least once every 16 hours and will include a bite bar to reduce the potential for injury.

CM 17. Wildlife Services field personnel will use trained dogs for dispersal of target wildlife only within the operational area of the airfield. Working dogs will be under direct control of the trainer at all times and will remain at least 200 feet from potentially occupied listed species habitat.

Table 3. Airports within the Project area with Wildlife Services staff assigned[1]

Airport	Owner	County	FWS Office	Listed species that may be affected	Critical Habitat
Beale Air Force Base	U.S. Air Force	Yuba	Sacramento	--	--
Edwards Air Force Base (Edwards)	U.S. Air Force	Kern	Palm Springs	*Desert tortoise*	--
French Valley Airport (French Valley)	Riverside County	Riverside	Palm Springs	*Stephens' kangaroo rat*	--
Hemet-Ryan Airport (Hemet-Ryan)	Riverside County	Riverside	Palm Springs	*Stephens' kangaroo rat*	*Spreading navarretia*
Jacqueline Cochran Regional Airport	Riverside County	Riverside	Palm Springs	--	--
John Wayne-Orange County Airport	Orange County	Orange	Carlsbad	--	--

Airport	Owner	County	FWS Office	Listed species that may be affected	Critical Habitat
Lemoore Naval Air Station (Lemoore)	U.S. Navy	Kings & Fresno	Sacramento	*Fresno kangaroo rat, giant kangaroo rat, Tipton kangaroo rat, San Joaquin kit fox*	--
Long Beach Airport (Daugherty Field)	City of Long Beach	Los Angeles	Carlsbad	--	--
Los Alamitos Army Airfield	U.S. Army	Orange	Carlsbad	--	--
Los Angeles International Airport	City of Los Angeles	Los Angeles	Carlsbad	--	--
March Air Reserve Base (March)	U.S. Air Force	Riverside	Palm Springs	*Stephens' kangaroo rat*	--
Metropolitan Oakland International Airport (Metro Oakland)	Port of Oakland	Alameda	San Francisco Bay-Delta	*California clapper rail*; *California least tern*; *western snowy plover*; *salt marsh harvest mouse*	--
Moffett Federal Airfield (Moffett)	NASA Ames Research Center	Santa Clara	San Francisco Bay-Delta	*California clapper rail*; *California least tern*; *western snowy plover*; *salt marsh harvest mouse*	--
Naval Outlying Landing Field Imperial Beach (NOLF IB)	U.S. Navy	San Diego	Carlsbad	*least Bell's vireo*; *light-footed Ridgeway's rail*; *southwestern willow flycatcher*	--
Naval Outlying Landing Field San Nicolas Island	U.S. Navy	Santa Cruz	Ventura	--	--
Norman Y Mineta San Jose International Airport	City of San Jose	Santa Clara	Sacramento	--	--
North Island Naval Air Station (North Island)) Naval Base Coronado	U.S. Navy	San Diego	Carlsbad	*California least tern*; *western snowy plover*	--
Ontario International Airport (Ontario)	Ontario International Airport Authority	San Bernardino	Palm Springs	--	--

Airport	**Owner**	**County**	**FWS Office**	**Listed species that may be affected**	**Critical Habitat**
Palm Springs International Airport	City of Palm Springs	Riverside	Palm Springs	--	--
Palmdale AFB (Plant 42 Airport)	U.S. Air Force	Kern	Palm Springs	--	--
Point Mugu Naval Air Station (Point Mugu)	U.S. Navy	Ventura	Ventura	*California least tern*; *western snowy plover*; *light-footed Ridgway's rail*; *least Bell's vireo*	--
San Bernardino International Airport (San Bernardino)	San Bernardino International Airport Authority	San Bernardino	Palm Springs	*San Bernardino Merriam's kangaroo rat*	*San Bernardino Merriam's kangaroo rat*; *Santa Ana sucker*
Travis Air Force Base (Travis)	U.S. Air Force	Solano	Sacramento	*California tiger salamander*	*Conservancy fairy shrimp*; *Contra Costa goldfields*; *vernal pool fairy shrimp*; *vernal pool tadpole shrimp*
Van Nuys Airport	Los Angeles World Airports	Los Angeles	Ventura	--	--
Vandenburg Air Force Base (Vandenburg)	U.S. Air Force	Santa Barbara	Ventura	*California tiger salamander*; *California least tern*; *least Bell's vireo*; *southwestern willow flycatcher*; *western snowy plover*	*red-legged frog*; *Gaviota tarplant*; *la Graciosa thistle*; *Vandenberg monkey flower*

[1] Color of row denotes FWS office.

Table 4. Airports within the Project Area where Wildlife Services is on call to respond to direct requests.[1]

Airport	**Owner**	**County**	**FWS Office**	**Listed species that may be affected**	**Critical Habitat**
Bakersfield Municipal Airport (Bakersfield)	City of Bakersfield	Kern	Sacramento	*giant garter snake*; *blunt-nosed leopard lizard*; *Tipton kangaroo rat, San Joaquin kit fox, southwestern willow flycatcher, yellow-billed cuckoo*	--

Airport	Owner	County	FWS Office	Listed species that may be affected	Critical Habitat
Brown Field Municipal Airport (Brown Field)	City of San Diego	San Diego	Carlsbad	*coastal California gnatcatcher*	--
Buchanan Field Airport	Contra Costa County	Contra Costa	Sacramento	--	--
Byron Airport (Byron)	Contra Costa County	Contra Costa	Sacramento	*California tiger salamander, San Joaquin kit fox*	*Contra Costa goldfields, delta smelt, vernal pool fairy shrimp*
California Redwood Coast-Humboldt County Airport (Humboldt)	Humboldt County	Humboldt	Arcata	*western snowy plover, yellow-billed cuckoo*	--
Camarillo Airport	Ventura County	Ventura	Ventura	--	--
Camp Roberts East Garrison (Camp Roberts)	U.S. Army	Monterey	Ventura	*least Bell's vireo, San Joaquin kit fox*	--
Castle Airport	Merced County	Merced	Sacramento	--	--
Chico Municipal Airport	City of Chico	Butte	Sacramento	--	--
China Lake Naval Air Station (China Lake)	U.S. Navy	Kern	Palm Springs	*desert tortoise*	--
Columbia Airport (Columbia)	Tuolumne County	Tuolumne	Sacramento	*California tiger salamander*	--
El Centro Naval Air Facility Airport	U.S. Navy	Imperial	Palm Springs	--	--
Gillespie Field Airport	San Diego County	San Diego	Carlsbad	--	--
Hayward Executive Airport	City of Hayward	Alameda	Sacramento	--	--
Herlong-Sierra Army Depot	U.S. Army	Lassen	Sacramento	--	--
Kingdon Airpark (Kingdon)	Privately-owned: AG Project Managemen t, LLC	San Joaquin	Sacramento	*California tiger salamander, giant garter snake*	--

Airport	**Owner**	**County**	**FWS Office**	**Listed species that may be affected**	**Critical Habitat**
Mc Millan Army Airfield (McMillan)	U.S. Army	San Luis Obispo	Ventura	*least Bell's vireo, southwestern willow flycatcher, San Joaquin kit fox*	--
Meadows Field Airport (Meadows Field)	Kern County	Kern	Sacramento	*giant garter snake, blunt-nosed leopard lizard, southwestern willow flycatcher, yellow-billed cuckoo, Tipton kangaroo rat, San Joaquin kit fox*	--
Mojave Air and Space Port (Mojave)	East Kern Airport District	Kern	Palm Springs	*desert tortoise*	--
Monterey Regional Airport (Monterey)	Monterey Peninsula Airport District	Monterey	Ventura	*California tiger salamander, California condor, least Bell's vireo*	--
Murray Field Airport (Murray Field)	Humboldt County	Humboldt	Arcata	*western snowy plover, yellow-billed cuckoo*	*tidewater goby*
Napa County Airport (Napa)	Napa County	Napa	Sacramento	*California clapper rail, California least tern, western snowy plover, yellow-billed cuckoo, salt marsh harvest mouse*	*vernal pool fairy shrimp, soft bird's beak*
Nut Tree Airport	Solano County	Solano	Sacramento	--	--
Oxnard Airport	Ventura County	Ventura	Ventura	--	--
Petaluma Municipal Airport	City of Petaluma	Sonoma	Sacramento	--	--
Ramona Airport (Ramona)	San Diego County	San Diego	Carlsbad	*arroyo toad, Stephens' kangaroo rat*	*arroyo toad, San Diego fairy shrimp, spreading navarretia*
Redding Municipal Airport	City of Redding	Shasta	Sacramento	--	*Slender Orcutt's grass, vernal pool fairy shrimp, vernal pool tadpole shrimp*

Airport	Owner	County	FWS Office	Listed species that may be affected	Critical Habitat
Sacramento McClellan Airfield	Privately-owned: McClellan Business Park, LLC	Sacramento	Sacramento	--	--
San Clemente Island Naval Auxiliary Landing Field (San Clemente Island)	U.S. Navy	Los Angeles	Carlsbad	*San Clemente Bell's sparrow, western snowy plover, San Clemente loggerhead shrike*	--
Santa Barbara Airport (Santa Barbara)	City of Santa Barbara	Santa Barbara	Ventura	*light-footed Ridgway's rail, western snowy plover, California least tern*	*tidewater goby*
Santa Maria Public Airport/Capt. G. Allan Hancock Field (Santa Maria)	Santa Maria Public Airport District	Santa Barbara	Ventura	*California tiger salamander, southwestern willow flycatcher, least Bell's vireo*	*California tiger salamander*
Stockton Metropolitan Airport (Stockton)	San Joaquin County	San Joaquin	Sacramento	*California tiger salamander, giant garter snake*	--
Tehachapi Municipal Airport	City of Tehachapi	Kern	Sacramento	--	--
Yuba County Airport	Yuba County	Yuba	Sacramento	--	--

[1] Color of row denotes FWS office.

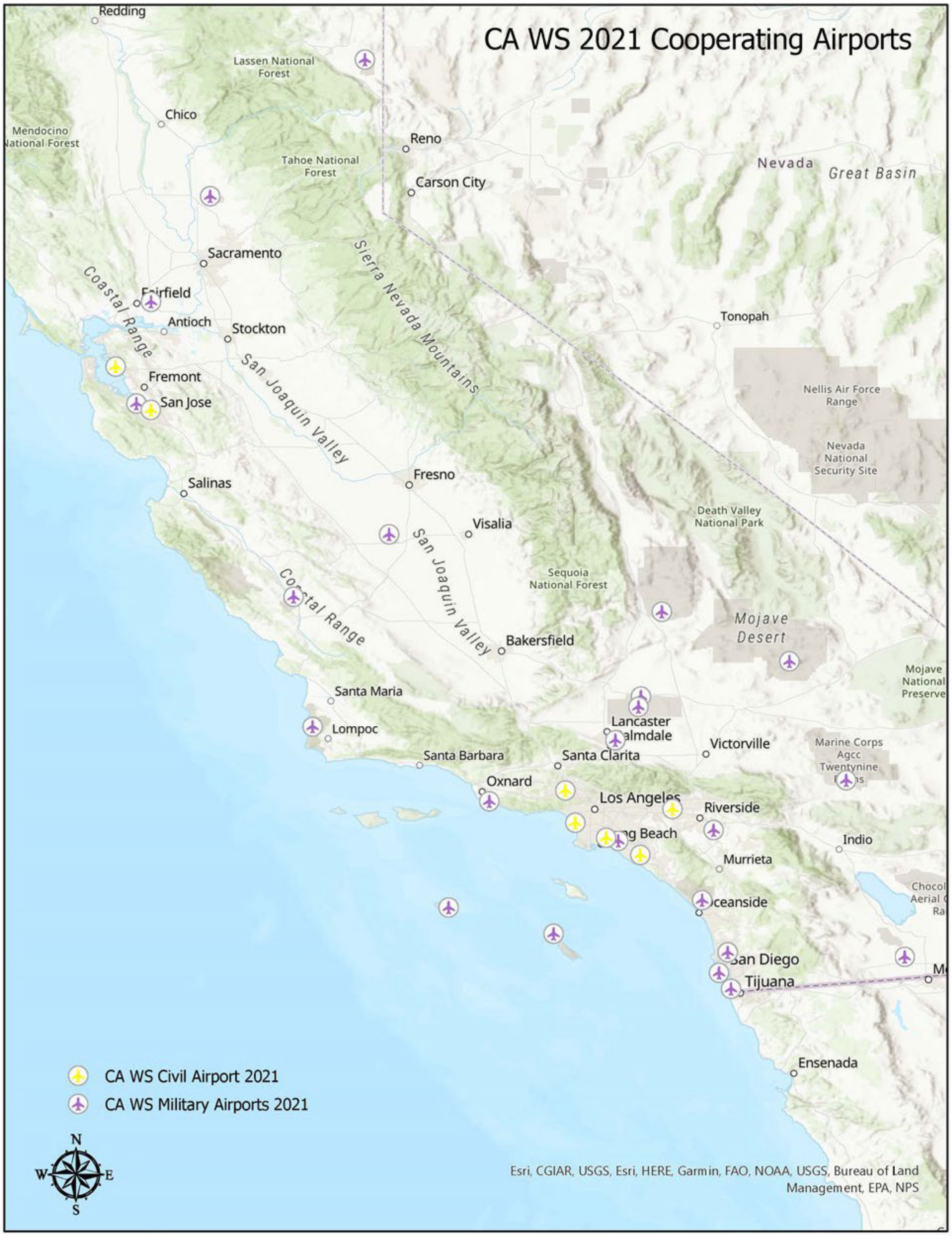

Figure 1. Airports Supported by Wildlife Services Wildlife Damage Management Program, 2021.

Potential Effects to Critical Habitat

Critical Habitat for 22 species occurs within the Project Area (Tables 3, 4); however, most management activities will occur in modified environments managed for the operation of aircraft. These areas are not likely to support the physical and biological features of Critical Habitat for the species identified in Tables 3 and 4. Management actions addressed by this consultation do not include construction activities, removal or destruction of vegetation, or habitat manipulation or modification. In addition, traps will be set primarily in previously disturbed areas with minimal soil disturbance (e.g., anchoring a small trap to the ground). Vehicle use would occur within the Project Area, including Critical Habitat. However, impacts to critical habitat from vehicle use will be insignificant because vehicle use will be low-intensity (e.g., one vehicle will be used at most supported airports), and vehicles will remain on existing roads and trails to the extent possible. To further reduce the potential for impacts, Wildlife Services field staff will receive training regarding the location of Critical Habitat within the Project Area and will avoid sensitive areas as directed by environmental staff at military bases and airports. Based on the low potential for actions that could impact habitat, we concur with the Wildlife Services determination that the Project is not likely to adversely affect Critical Habitat within the Project Area.

Potential Effects to Listed Species

Airports are modified anthropogenic environments and typically include a fully fenced aircraft operations area, supporting airport administration and operations structures, safety buffer zones, parking lots, car rental lots, or other buildings and facilities. Airports include extensive paved surfaces, but also often include grasslands or turf grasses. Grasslands and turf grasses are mowed or otherwise maintained by airfield operators (i.e., not maintained by Wildlife Services)—at a typical height of less than 14 inches—to reduce wildlife use, increase visibility, and improve safety on the airfield. Some airports include, or are adjacent to, open, undeveloped land, including potential listed species habitats.

The analysis of potential effects to listed species includes a general assessment of exposure and potential effects for different taxonomic groups (e.g., birds, mammals, amphibians, and reptiles) and then a species-specific assessment for each listed species.

Listed Bird Species

<u>Exposure</u>

The potential for listed bird species to be present in operational areas within the Project area is generally low, but some species may occupy suitable habitat at the periphery of runways, taxiways, and operational areas (Tables 3, 4). Listed birds on or near runways, taxiways, or operational areas could be exposed to vehicles, auditory and visual deterrents, traps, and toxicants used during wildlife management. The infrequent use of many management techniques (Table 2; Appendix D) and the generally low potential for listed bird species to be present, results in a low potential for exposure of listed bird species to airport wildlife management activities. To further reduce the potential for exposure, Wildlife Services personnel will complete training to ensure that they are aware of the location of potential listed species and habitat on each airfield (CM 1). Field personnel will also maintain a 200-foot buffer between management techniques and listed bird species habitat (CM 7, CM 8, CM 10) and limit the use of working dogs to operational areas where they will remain under direct control of a handler (CM 16), which will further reduce the potential for exposure. Listed birds may be exposed to project-related vehicles as they traverse the airfield; however, the potential for exposure will be reduced because a single vehicle is used at each airfield, and personnel will remain on existing maintained roadways (CM 4, CM 5).

Effects

If exposed to wildlife management activities, listed bird species could be disrupted by human presence, visual or auditory wildlife deterrents, or struck by Project vehicles. Visual and auditory wildlife deterrents intended to haze target wildlife from the airfield or capture target species could be detected by birds inhabiting the airfield or adjacent suitable habitat and temporarily disturb or displace them from foraging or roosting areas. If disruption occurs during the nesting season, such visual or auditory stimuli could interrupt incubation or brooding. However, for many management actions, limited exposure resulting from the low anticipated frequency (Table 2) will reduce the potential for exposure and resulting effects to a discountable level. For activities that may occur more frequently, the implementation of a 200-foot buffer between management activities and adjacent habitat will reduce the response to the stimuli to a level of insignificance. If listed species are roosting directly on a runway, taxiway, or within the operational area, they could respond to the visual or auditory deterrent by flushing and departing from the runway, taxiway, operational area into adjacent suitable habitat. Movement away from the runway, taxiway, or operational area will reduce the exposure of the birds to potential hazards such as moving aircraft and vehicles (Service 2014a). No adverse effect is expected from such intermittent and temporary disturbance because birds will be displaced from the runway, taxiway, or other operational area into suitable habitat, and the frequency of such an event is expected to be very low.

Wildlife Services personnel will not target listed bird species for wildlife except in the event of unforeseeable emergency situations. If a health and human safety situation arises involving listed species interaction with aircraft (e.g., a California condor frequenting an active airfield), Wildlife Services may haze the bird from the active airfield to protect both aircraft and the bird (Service 2014a). Wildlife Services will then coordinate with the Service using the Emergency Consultation Process (Appendix A). Although listed bird species could be present in the general vicinity of traps, traps are designed to capture species with different life histories than the listed taxa, and Wildlife Services personnel will target individuals during capture events. For example, traps often use prey to attract a target bird, and none of the listed taxa are predatory, so they would not be attracted to such a trap. Thus, the potential for incidental capture of listed bird species is discountable. Listed bird species are also unlikely to ingest and be harmed by toxins used during wildlife management because they would not be exposed to the toxins based on deployment techniques. For example, DRC-1339, a corvicide, could be used on airfields to reduce corvid populations. Although this toxin could affect listed taxa if consumed, it is deployed in chicken eggs, which would not be consumed by any of the listed taxa. Based on deployment techniques, the potential for impacts to listed taxa from use of toxins is discountable.

California Ridgway's rail

The California Ridgway's rail has the potential to occur at two airports within the Project area (Moffett and Metro Oakland). Suitable wetland habitat at these airports is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that the Project is not likely to adversely affect the California Ridgway's rail.

Coastal California gnatcatcher

The coastal California gnatcatcher potentially occurs in coastal sage scrub habitat adjacent to one airport within the Project area (Brown Field). Habitat at this airport is limited to the periphery of the operational areas, and few gnatcatchers have been detected at the airfield. Thus, potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the California gnatcatcher.

California least tern

The California least tern is recorded nesting or foraging in the vicinity of eight airports in the Project Area (NOLF IB, North Island, Vandenburg, Point Mugu, Santa Barbara, Napa, Moffett, and Metro Oakland). Of these, North Island is the only airfield where least terns nest and active deterrence has been necessary to sustain safe conditions for air traffic. On North Island and Point Mugu, airport activities that may affect least terns on the airfield are conducted pursuant to formal consultations with between the U.S. Navy and the Service (Service 2014b, Service 2014c). At the remaining airports, the potential for exposure and effects is consistent with the general description provided above. If least terns are detected nesting on an airfield, additional consultation will be initiated by the federal landowner (e.g., the U.S. Navy for Navy airfields), or in the absence of a federal landowner, by Wildlife Services. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the California least tern.

Least Bell's vireo

The least Bell's vireo potentially occurs in riparian habitat in the vicinity of six airports within the Project area (Camp Roberts, Monterey, McMillan, Point Mugu, Vandenburg, and NOLF IB). Habitat at these airports is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the least Bell's vireo.

Light-footed Ridgway's rail

The light-footed Ridgway's rail potentially occurs in wetland habitat in the vicinity of three airports within the Project area (NOLF IB, Point Mugu, and Santa Barbara). Habitat at these airports is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the light-footed Ridgway's rail.

San Clemente Bell's sparrow

The San Clemente Bell's sparrow potentially occurs in shrubland near one airport within the Project area (San Clemente Island). Habitat at this airport is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the San Clemente Bell's sparrow.

Southwestern willow flycatcher

The southwestern willow flycatcher potentially occurs in riparian habitat in the vicinity of six airports within the Project area (NOLF IB, Bakersfield, Meadows Field, McMillan, Santa Maria, and Vandenburg). Habitat at these airports is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the southwestern willow flycatcher.

Western snowy plover

The western snowy plover potentially occurs at 10 airports within the Project area (Oakland, Moffett, Santa Barbara, San Clemente Island, Humboldt, Napa, North Island, Point Mugu, and Vandenburg), but the species has been recorded within the Project area at only two airports (North Island and Point Mugu). North Island is the only airfield in the Project area where active deterrence has been necessary to sustain safe conditions for air traffic. On North Island, deterrence of snowy plovers on the airfield is conducted pursuant to a formal consultation with Naval Base Coronado (Service 2005), and impacts to snowy plovers associated with airfield operations at Point Mugu is addressed in consultation with Naval Base Ventura (Service 2014b). Biological Opinion 8-8-14-F-5R remains in effect at Point Mugu and is not replaced by this consultation. At the remaining airfields, suitable habitat is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the snowy plover.

Yellow-billed cuckoo

The yellow-billed cuckoo potentially occurs at four airports within the Project area (Bakersfield, Humboldt, Meadows Field, and Napa). Habitat at these airports is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the yellow-billed cuckoo.

Mammals

Exposure

The potential for listed mammals to be present in operational areas within the Project area is low, but some species may occupy suitable habitat at the periphery of runways, taxiways, and operational areas (Tables 3, 4). Listed mammals on or near runways, taxiways, or operational areas could be exposed to vehicles, auditory and visual deterrents, traps, and toxicants used during wildlife management. The infrequent use of many management techniques (Table 2; Appendix D) and the generally low potential for listed mammal species to be present in the Project area results in a low potential for exposure to Project activities. To further reduce the potential for exposure, Wildlife Services personnel will complete training to ensure that they are aware of the location of potential listed species and habitat (CM 1). Field personnel will also maintain a 200-foot buffer between management actions and listed species habitat (CM 7, CM 8, CM 10), which will further reduce the potential for exposure. Listed mammals may be exposed to project-related vehicles or pedestrian traffic, but the potential for exposure will be reduced by (1) limiting vehicle travel to existing maintained roadways and adhering to a 15-mph speed limit (CM 4) and (2) walking on existing runways, taxiways, trails, and roads when conducting management activities consistent with safety requirements (CM 5). Mammals could be exposed to working dogs on the airfield, but the potential for exposure is discountable because listed mammal species are unlikely to be present within operational areas and working dogs will remain within the operational area under the direct control of Wildlife Services personnel. Wildlife Services personnel will also avoid using lethal chemicals or lethal traps that could result in the direct loss of listed mammals at airfields where the species could be affected, which significantly reduces the potential for impacts to listed mammals. In summary, exposure of listed mammals to wildlife management techniques will be limited due to the limited availability or suitability of habitat in the vicinity of operational areas, low frequency of implementation of most wildlife management techniques, conservation measures that will limit the methods used at airfields where listed mammals could be present, implementation of 200-foot buffers between management techniques and listed species habitat, and low volume of vehicle traffic (e.g. one vehicle on airfield) associated with the project.

Effects

Mammals that are exposed to wildlife management activities on airports could be disturbed, harmed, or killed by vehicles, auditory deterrents, traps, dogs, and rodenticides or avicides. Wildlife Services will, however, implement measures to reduce the potential for exposure that will avoid take and limit effects to listed mammal species. Limited potential for exposure resulting from the low anticipated frequency (Table 2) and distance between management activities and adjacent habitat (200-foot buffer) will generally reduce the species' response to the stimuli to a level of insignificance, and the potential for accidental capture will be discountable. Education and training of field personnel will increase vigilance and awareness as personnel travel across airfields and vehicles will generally implement a 15-mph speed limit on airfields, which will reduce the potential for collision. Field personnel may infrequently operate a vehicle at higher speed if in pursuit of a target individual animal (Odell 2022, pers. comm.), but overall, the potential for collision will be reduced to a discountable level. Although listed mammals could detect auditory and visual deterrents directed towards wildlife on the airfield, the distance of the deterrent from suitable habitat (200-foot buffer between management activities and adjacent habitat) and the intermittent use of these deterrents will reduce the detectability and disruption to an insignificant level. Listed mammals could be harmed or killed by toxins used to remove target animals, but the potential for exposure will be reduced to a discountable level by limiting use of these methods at airfields that may support listed mammals (CM 11). Listed mammals could also be trapped or harmed during efforts remove target species, but Wildlife Services will avoid the use of potentially harmful or lethal trapping techniques on most airfields that support mammals susceptible to trapping, implement 200-foot buffers between management activities and listed species habitat, and implement species-specific measures to prevent exposure of listed species to traps and toxins (listed for each species below).

Fresno kangaroo rat

The Fresno kangaroo rat potentially occurs at one airport within the Project area (Lemoore). The potential for exposure and effects is consistent with the general description provided above. In addition, gas cartridges and small mammal snap traps will not be used at this airfield to ensure that impacts to this species are avoided (CM 12). Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the Fresno kangaroo rat.

Salt marsh harvest mouse

The salt marsh harvest mouse potentially occurs on, or near, three airports within the Project area (Metro Oakland, Moffett, and Napa). Wildlife Services staff at Moffett may periodically employ seasonal use of body gripping traps to target larger mammals (Odell 2022, pers. comm.); however, the potential for the diminutive salt marsh harvest mouse to trigger these traps is discountable. In addition, if body gripping traps are necessary to meet Project objectives, Wildlife Services personnel will place traps at least 200 feet from salt marsh harvest mouse habitat. In addition, gas cartridges and small mammal snap traps will not be used at these airports to ensure that impacts to this species are avoided (CM 12). Thus, the potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the salt marsh harvest mouse.

San Bernardino Merriam's kangaroo rat

The San Bernardino Merriam's kangaroo rat potentially occurs on or near one airport within the Project Area (San Bernardino). The potential for exposure and effects is consistent with the general description provided above. In addition, gas cartridges and small mammal snap traps will not be used at this airfield to ensure that impacts to this species are avoided (CM 12). Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the San Bernardino Merriam's kangaroo rat.

San Joaquin kit fox

San Joaquin kit fox may be present in the vicinity of six airfields within the action area (Lemoore, Bakersfield, Byron, Camp Roberts, Castle, McMillan, and Meadows Field). The potential for exposure and effects is largely consistent with the general description provided above. Wildlife Services will implement conservation measures to reduce the potential for San Joaquin kit fox exposure to pesticides. Since San Joaquin kit fox are capable climbers and could potentially access and consume DRC-1339, it (DRC-1339) will not be used at Lemoore, Bakersfield, Byron, Camp Roberts, Castle, McMillan, and Meadows Field, thereby eliminating the potential for harm to the San Joaquin kit fox. Likewise, mammal traps that could harm kit foxes (leg-hold, body snare, body grip) will not be used at Bakersfield, Byron, Camp Roberts, Castle, McMillan, and Meadows Field (CM 13), thereby eliminating the potential for impacts to San Joaquin kit fox at these airfields. Padded leghold traps are periodically necessary to effectively maintain airfield safety at Lemoore and have been used when needed at this airfield for 20 years with no capture of San Joaquin kit fox. Trap modifications [i.e., modified pan tension (CM 14)] will reduce the potential for capture of San Joaquin kit fox at Lemoore. Based on the history with no capture of San Joaquin kit fox, we consider the potential for capture discountable. There is also limited potential for San Joaquin kit fox to become entrapped in cage traps, which could be used to capture target mammals, but this technique has been periodically used for 20 years with no capture of San Joaquin kit foxes (Orthmeyer 2022, pers. comm.). Thus, we consider the potential for entrapment in cage traps to be discountable. Furthermore, Wildlife Services will generally use cage traps only outside the natal season (CM 14, CM 15) to ensure that, in the unlikely event a fox is captured in a cage trap, no offspring will be left unattended. Although there could be occasional exposure of foxes to auditory deterrents, these impacts would be of short duration, infrequent, and are anticipated to have an insignificant effect on San Joaquin kit fox survival and reproduction. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the San Joaquin kit fox.

Stephens' kangaroo rat

Stephens' kangaroo rat may be present in the vicinity of four airfields within the action area (Ramona, March, Hemet-Ryan, and French Valley). The potential for exposure and effects is consistent with the general description provided above. In addition, gas cartridges and small mammal snap traps will not be used at these airfields (CM 12) to ensure that impacts to this species are avoided. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the Stephens' kangaroo rat.

Tipton kangaroo rat

Tipton kangaroo rat may be present in the vicinity of three airfields within the Project Area (Lemoore, Bakersfield, and Meadows Field). The potential for exposure and effects is consistent with the general description provided above. In addition, gas cartridges and small mammal snap traps will not be used at this airfield (CM 12) to ensure that impacts to this species are avoided. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the Tipton kangaroo rat.

Amphibians

<u>Exposure</u>

The potential for listed amphibians to be present in operational areas within the Project area is low, but two listed amphibian species (arroyo toad and California tiger salamander) may occupy suitable habitat at the periphery of supported runways, taxiways, and other operational areas (Tables 3, 4). Listed amphibians on or near runways, taxiways, or operational areas could be exposed to vehicles, auditory and visual deterrents, traps, and toxicants used during wildlife management. The infrequent use of many management techniques (Table 2; Appendix D) and the generally low potential for listed amphibian species to be present in the Project area result in a low potential for exposure of listed amphibians to airport wildlife management activities. To further reduce the potential for exposure, Wildlife Services personnel will complete training to ensure that they are aware of the location of potential listed species and habitat (CM 1). No gas cartridges will be used at airfields that could support listed amphibians without further coordination with the Service (CM 12), so exposure to this toxin unlikely. Field personnel will maintain a 200-foot buffer between management techniques and listed species habitat (CM 8, CM 10), which will further reduce the potential for exposure because listed amphibian species, where present, are generally found at the periphery of the airfield rather than within the operational areas. Listed amphibians may be exposed to project-related vehicles as they traverse the airfield. The potential for exposure will be reduced because personnel will remain on existing maintained roadways and maintain a 15-mph speed limit (CM 4, CM 5). To further reduce the potential of vehicle collision with amphibians, Wildlife Services will avoid vehicle travel during and immediately after rain events (when amphibians are likely to be active) to the extent consistent with airfield safety (CM 6).

Effects

Listed amphibians that are exposed to wildlife management activities in the Project Area could be struck by vehicles, chased or harmed by working dogs, or become incidentally trapped in traps intended for target species such as rodents. Wildlife Services will, however, travel on maintained roads on the airfield, maintain a 15-mph speed limit, and avoid vehicle travel during and immediately after rain events. Thus, the potential for vehicle strike is discountable. The potential for interaction with working dogs will be reduced by limiting working dog presence to only the active airfield and maintaining a 200-foot buffer between dogs and potential habitat. Thus, the potential for impacts from working dogs is also discountable. Wildlife Services will also implement conservation measures to ensure that listed amphibians are not incidentally trapped. Incorporation of the 200-foot buffer between traps and habitat that could support listed reptiles and amphibians will reduce the potential for incidental trapping of listed reptiles and amphibians to a discountable level.

Arroyo toad

The arroyo toad occurs in the vicinity of one airfield identified within the Project area (Ramona), but habitat conditions on this airfield do not include streams that could support arroyo toad breeding. Arroyo toads could occupy the upland habitat in undeveloped parts of the airfield and could move across the roads at night. Arroyo toad habitat at Ramona is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that wildlife management activities are not likely to adversely affect the arroyo toad.

California Tiger Salamander

The California tiger salamander may occur on, or in the general vicinity of, eight airports identified within the Project area (Travis, Vandenberg, Byron, Columbia, Kingdon, Monterey, Santa Maria, and Stockton). Habitat at these airports is at the periphery of the operational areas, and potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that wildlife management activities are not likely to adversely affect the California tiger salamander.

Reptiles

Exposure

The potential for listed reptiles to be present in operational areas within the Project area is low, but three listed reptile species (blunt-nosed leopard lizard, desert tortoise, and giant garter snake) may occupy suitable habitat at the periphery of supported runways, taxiways, and operational areas (Tables 3, 4). Listed reptiles on or near runways, taxiways, or operational areas could be exposed to vehicles, auditory and visual deterrents, traps, and toxicants used during wildlife management. The infrequent use of many management techniques (Table 2; Appendix D) and the generally low potential for listed reptiles to be present in the Project area result in a low potential for exposure of listed reptiles to airport wildlife management activities. To further reduce the potential for exposure, Wildlife Services personnel will complete training to ensure that they are aware of the location of potential listed species and habitat (CM 1). No gas cartridges will be used at airfields that could support listed reptiles without further coordination with the Service (CM 12), so exposure to this toxin is unlikely. Field personnel using some management techniques will remain at least 200 feet from listed species habitat (CM 8, CM 10), which will further reduce the potential for exposure. Listed reptiles may be exposed to project-related vehicles when parked, or as they traverse the airfield. The potential for exposure will be reduced because personnel will remain on existing maintained roadways and maintain a 15-mph speed limit.

Effects

Listed reptiles that are present within the Project Area could be struck by vehicles or become incidentally caught in traps intended for target species, such as rodents. The potential for vehicle collision or incidental capture is significantly reduced by travel on maintained roadways, implementation of speed limits, and conservation measures to reduce the potential for exposure of listed reptiles to traps intended for target species. Field personnel will maintain a 200-foot buffer between traps and habitat that could support listed reptiles and amphibians. Field personnel will receive training and instruction to maintain buffers between habitat and activities that could disturb or harm listed reptiles. No gas cartridges will be used at airfields that could support listed fossorial reptiles. Working dogs used to discourage avian roosting on the airfield will only be used in operational areas of the airfield, and a 200-foot buffer will be maintained between potential habitat and working dogs.

Blunt-nosed leopard lizard

The blunt-nosed leopard lizard may occur on, or in the general vicinity of, two airports identified within the Project area (Bakersfield, Meadows Field). The potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure and implementation of conservation measures, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the blunt-nosed leopard lizard.

Desert tortoise

The desert tortoise may occur on, or in the general vicinity of, three airports identified within the Project area (Edwards, China Lake, Mojave). The potential for exposure and effects is consistent with the general description provided above. Wildlife Services will avoid potential for crushing a tortoise by checking the area underneath and adjacent to the truck or car prior to moving the vehicle. If a desert tortoise is found underneath a vehicle, that vehicle will not be moved until the tortoise has moved out from under it. Based on the low potential for exposure and implementation of conservation measures, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the desert tortoise.

Giant garter snake

The giant garter snake may occur on, or in the general vicinity of, four airports identified within the Project area (Bakersfield, Kingdon, Meadows, Stockton). The potential for exposure and effects is consistent with the general description provided above. Based on the low potential for exposure and implementation of conservation measures, the potential for adverse effects is discountable or insignificant, and we concur with Wildlife Services' determination that activities are not likely to adversely affect the giant garter snake.

Based on the site and species information described above, and Wildlife Services' commitment to implement conservation measures to reduce the potential for impacts, we concur that all project potential impacts to listed species on airfields in California will be avoided or reduced to a level of insignificance, supporting the determination that the proposed project is not likely to adversely affect these species. Therefore, the interagency consultation requirements of section 7 of the Act have been satisfied. Should project plans change or if additional information on the distribution of listed or proposed species or effects of management activities becomes available, this determination may be reconsidered and further section 7 consultation may be required.

Thank you for your efforts to minimize the potential for impacts to threatened and endangered species associated with wildlife management at airfields. We look forward to continuing to work with you to provide species information and education for your airport staff. If you have any questions or concerns regarding this consultation, please contact the appropriate U.S. Fish and Wildlife Service office (Tables 3, 4) or Sandy Vissman[4] at 760-431-9440, extension 274.

Sincerely,

JONATHAN SNYDER

Digitally signed by JONATHAN SNYDER
Date: 2022.12.16 16:31:51 -08'00'

Jonathan D. Snyder
Assistant Field Supervisor

Appendices

[4] sandy_vissman@fws.gov.

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PERSONAL COMMUNICATIONS

Odell, R. 2022. Email from Russel Odell, acting Wildlife Services State Director, on August 15, 2022 pertaining to historical use of conibear traps at Moffett Airfield, and leghold traps at Lemoore.

Orthmeyer, D. 2022. Telephone conversation with Dennis Orthmeyer, Wildlife Services California State Director, on May 2, 2022 pertaining to potential for trapping of San Joachin kit fox in cage traps.

APPENDIX A

EMERGENCY CONSULTATION FORM

EMERGENCY ENDANGERED SPECIES CONSULTATION FORM

AIRPORT WILDLIFE DAMAGE MANAGEMENT PROGRAM
WILDLIFE SERVICES-CALIFORNIA

This form is intended for documentation of emergency consultation with the U.S. Fish and Wildlife Service (FWS) for species listed under the Federal Endangered Species Act (ESA). The U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service-Wildlife Services (WS) has consulted with the FWS on Wildlife Damage Management Activities to support airfields in California and based on low potential for occurrence of species in operational areas and low potential for exposure, the FWS concurred with a determination of May Effect, but Not Likely to Adversely Affect listed species. This form is intended to streamline consultation when unanticipated emergency health and human safety activities related to wildlife management at airfields in California may affect federally listed species.

Emergency Contact: FWS should be contacted as soon as possible by telephone at: 916-414-6464. Consultation may be initiated by telephone; however, this form will be completed no later than 24 hours following the notification of the emergency and transmitted via email to regarding emergency wildlife hazard response actions.

Instructions for Completing the Form

The person designated by APHIS WS for ESA consultation should complete page 2. All response actions should be indicated, including any pre-approved practices to avoid or minimize impacts to listed species and critical habitats.

FWS will complete an effects assessment considering the response actions and standard practices implemented. FWS will provide recommendations to avoid and minimize any potentially adverse effects. FWS will transmit the completed form to APHIS Wildlife Services within 24 hours of receipt.

Awaiting a response from FWS should not delay emergency response activities.

APHIS Wildlife Services will implement as many measures and conservation measures as feasible without delaying necessary emergency response. FWS will be available for further coordination as requested.

Post Emergency

Once the emergency response actions are over, the Service will be notified of any effects to listed species or critical habitat. If no adverse effects occurred, the person designated by WS for ESA consultation will send a letter to the Service asking for concurrence that action was “not likely to adversely affect” the species. If any adverse effects to listed species or critical habitat resulted from the emergency response activities, formal consultation with the Service will be required.

EMERGENCY ENDANGERED SPECIES CONSULTATION FORM

DATE OF TRANSMITTAL:

CONTACT INFORMATION:

FROM: **APHIS WS- California**	**NAME:** **EMAIL:**	**Phone:** **Fax:**
TO: **USFWS** **Pacific Southwest Regional Office**	**NAME:** **Section 7 Coordinator** **EMAIL:** **r8roa7coordinatorteam@doimspp.onmicrosoft.com**	**Phone:** **916-943-8529 (24-hour)** **Fax:** **916-414-6486**

NAME OF INCIDENT:

DATE OF INCIDENT:

LOCATION INFORMATION:

AIRFIELD NAME	LATITUDE	LONGITUDE

DESCRIPTION OF INCIDENT: (*Be as complete as possible*)

Nature of Emergency:

Listed Species Affected:

Wildlife Management Techniques Employed:

Outcome: (*species response or disposition and other relevant details*)

FWS RECOMMENDATIONS:

Date	Recommendations	Listed Species	Accepted? (Y/N, Date)	Implemented (Y/N, Date)

APPENDIX B

SPECIES RECIEVING A "NO EFFECT" DETERMINATION

Wildlife Services obtained a list of federally threatened and endangered species and species and designated Critical Habitat in the Project Area from the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) website on May 17, 2021. Wildlife Services determined that the project would have no effect on the following threatened and endangered species that; occur in habitats that are not present in the project area, occur outside of the geographical or elevation of the project area, would not be affected by project methods or activities.

Amphibians

1. California red-legged frog (*Rana draytonii*)
2. Mountain yellow-legged frog (*Rana muscosa*)
3. Sierra Nevada yellow-legged frog (*Rana sierrae*)
4. Yosemite toad (*Anaxyrus canorus*)

Birds

1. Marbled murrelet (*Brachyramphus marmoratus*)
2. Northern spotted owl (*Strix occidentalis caurina*)
3. San Clemente loggerhead shrike (*Lanius ludovicianus mearnsi*)
4. San Clemente sage sparrow (*Amphispiza belli clementeae*)
5. Short-tailed albatross [*Phoebastria* (=*Diomedea*) *albatrus*]

Mammals

1. Buena Vista Lake ornate shrew (*Sorex ornatus relictus*)
2. Fisher (*Pekania pennanti*)
3. Pacific pocket mouse (*Perognathus longimembris pacificus*)
4. Peninsular bighorn sheep (*Ovis canadensis nelsoni*)
5. Riparian brush rabbit (*Sylvilagus bachmani riparius*)
6. Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)

7. Southern sea otter (*Enhydra lutris nereis*)

Reptiles

1. Coachella Valley fringe-toed lizard (*Uma inornata*)
2. Green sea turtle (*Chelonia mydas*)
3. San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)

Crustaceans

1. California freshwater shrimp (*Syncaris pacifica*)
2. Conservancy fairy shrimp (*Branchinecta conservation*)
3. Longhorn fairy shrimp (*Branchinecta longiantenna*)
4. Riverside fairy shrimp (*Streptocephalus woottoni*)
5. San Diego fairy shrimp (*Branchinecta sandiegonensis*)
6. Vernal pool fairy shrimp (*Branchinecta lynchi*)
7. Vernal pool tadpole shrimp (*Lepidurus packardi*)

Fishes

1. Delta smelt (*Hypomesus transpacificus*)
2. Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*)
3. Mohave Tui Chub (*Gila bicolor* ssp. *Mohavensis*)
4. Owens pupfish (*Cyprinodon radiosus*)
5. Owens Tui chub (*Gila bicolor* ssp. *Snyderi*)
6. Santa Ana sucker (*Catostomus santaanae*)
7. Tidewater goby (*Eucyclogobius newberryi*)
8. Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)

Flowering plants

1. Antioch dunes evening-primrose (*Oenothera deltoides* ssp. *Howellii*)

2. Ash-grey paintbrush (*Castilleja cinerea*)
3. Bakersfield cactus (*Opuntia treleasei*)
4. Beach layia (*Layia carnosa*)
5. Bear valley sandwort (*Arenaria ursine*)
6. Big-leaved crownbeard (*Verbesina dissita*)
7. Braunton's milk-vetch (*Astragalus brauntonii*)
8. Burke's goldfields (*Lasthenia burkei*)
9. Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*)
10. California jewelflower (*Caulanthus californicus*)
11. California orcutt grass (*Orcuttia californica*)
12. California seablite (*Suaeda californica*)
13. California taraxacum (*Taraxacum californicum*)
14. Chorro Creek bog thistle (*Cirsium fontinale* var. *obispoense*)
15. Clover lupine (*Lupinus tidestromii*)
16. Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*)
17. Coastal dunes milk-vetch (*Astragalus tener* var. *titi*)
18. Colusa grass (*Neostapfia colusana*)
19. Contra Costa goldfields (*Lasthenia conjugens*)
20. Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*)
21. Cushenbury milk-vetch (*Astragalus albens*)
22. Cushenbury oxytheca (*Oxytheca parishii* var. *goodmaniana*)
23. Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)
24. Encinitas baccharis (*Baccharis vanessae*)
25. Fish slough milk-vetch (*Astragalus lentiginosus var. piscinensis*)

26. Fleshy owl's-clover (*Castilleja campestris* ssp. *succulenta*)
27. Fountain thistle (*Cirsium fontinale* var. *fontinale*)
28. Franciscan manzanita (*Arctostaphylos franciscana*)
29. Gambel's watercress (*Rorippa gambellii*)
30. Gaviota tarplant (*Deinandra increscens ssp. villosa*)
31. Greene's tuctoria (*Tuctoria greenei*)
32. Hartweg's golden sunburst (*Pseudobahia bahiifolia*)
33. Hickman's potentilla (*Potentilla hickmanii*)
34. Indian knob mountainbalm (*Eriodictyon altissimum*)
35. Keck's (pedate) checker-mallow (*Sidalcea keckii*)
36. La Graciosa thistle (*Cirsium loncholepis*)
37. Laguna beach liveforever (*Dudleya stolonifera*)
38. Large-flowered fiddleneck (*Amsinckia grandiflora*)
39. Lompoc yerba santa (*Eriodictyon capitatum*)
40. Lyon's pentachaeta (*Pentachaeta lyonii*)
41. Many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*)
42. Marin dwarf-flax (*Hesperolinon congestum*)
43. Marsh sandwort (*Arenaria paludicola*)
44. Menzies' wallflower (*Erysimum menziesii*)
45. Mexican flannelbush (*Fremontodendron mexicanum*)
46. Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*)
47. Monterey spineflower (*Chorizanthe pungens* var. *pungens*)
48. Morro manzanita (*Arctostaphylos morroensis*)
49. Munz's onion (*Allium munzii*)

50. Nevin's barberry (*Berberis nevinii*)

51. Orcutt's spineflower (*Chorizanthe orcuttiana*)

52. Otay mesa-mint (*Pogogyne nudiuscula*)

53. Otay tarplant [*Deinandra* (=*Hemizonia*) *conjugens*]

54. Palmate-bracted bird's beak (*Cordylanthus palmatus*)

55. Parish's daisy (*Erigeron parishii*)

56. Pedate checker-mallow (*Sidalcea pedata*)

57. Pismo clarkia (*Clarkia speciosa* ssp. *immaculata*)

58. Pitkin marsh lily (*Lilium pardalinum* ssp. *pitkinense*)

59. Presidio manzanita (*Arctostaphylos hookeri* var. *ravenii*)

60. Purple amole (*Chlorogalum purpureum*)

61. Robust spineflower (*Chorizanthe robusta* var. *robusta*)

62. Sacramento orcutt grass (*Orcuttia viscida*)

63. Salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*)

64. San Bernardino bluegrass (*Poa atropurpurea*)

65. San Bernardino mountains bladderpod (*Lesquerella kingii* ssp. *bernardina*)

66. San Clemente Island bush-mallow (*Malacothamnus clementinus*)

67. San Clemente Island larkspur (*Delphinium variegatum* ssp. *kinkiense*)

68. San Clemente Island lotus [=broom (*Acmispon dendroideus var. traskiae*)]

69. San Clemente Island Paintbrush (*Castilleja grisea*)

70. San Clemente Island woodland-star (*Lithophragma maximum*)

71. San Diego ambrosia (*Ambrosia pumila*)

72. San Diego button-celery (*Eryngium aristulatum* var. *parishii*)

73. San Diego mesa-mint (*Pogogyne abramsii*)

74. San Diego thornmint (*Acanthomintha ilicifolia*)

75. San Francisco lessingia [*Lessingia germanorum* (=*L.g.* var. *germanorum*)]

76. San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*)

77. San Joaquin (Valley) orcutt grass (*Orcuttia inaequalis*)

78. San Joaquin wooly-threads [*Monolopia* (=*Lembertia*) *congdonii*]

79. San mateo thornmint (*Acanthomintha obovata* ssp. *duttonii*)

80. San Mateo woolly sunflower (*Eriophyllum latilobum*)

81. Santa Ana river woolly-star (*Eriastrum densifolium* ssp. *sanctorum*)

82. Santa Cruz tarplant (*Holocarpha macradenia*)

83. Sebastopol meadowfoam (*Limnanthes vinculans*)

84. Showy Indian clover (*Trifolium amoenum*)

85. Slender Orcutt grass (*Orcuttia tenuis*)

86. Slender-horned spineflower (*Dodecahema leptoceras*)

87. Slender-petaled mustard (*Thelypodium stenopetalum*)

88. Soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*)

89. Sonoma Alopecurus (*Alopecurus aequalis* var. *sonomensis*)

90. Sonoma spineflower (*Chorizanthe valida*)

91. Sonoma sunshine (*Blennosperma bakeri*)

92. Southern mountain wild-buckwheat (*Eriogonum kennedyi* var. *austromontanum*)

93. Spreading navarretia (*Navarretia fossalis*)

94. Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*)

95. Thread-leaved brodiaea (*Brodiaea filifolia*)

96. Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*)

97. Vine Hill clarkia (*Clarkia imbricata*)

98. Western lily (*Lilium occidentale*)
99. White sedge (*Carex albida*)
100. White-rayed pentachaeta (*Pentachaeta bellidiflora*)
101. Willowy monardella (*Monardella viminea*)
102. Yadon's piperia (*Piperia yadonii*)
103. Yellow larkspur (*Delphinium luteum*)

Insects

1. Bay checkerspot butterfly (*Euphydryas editha bayensis*)
2. Callippe silverspot butterfly (*Speyeria callippe callippe*)
3. Carson wandering skipper (*Pseudocopaeodes eunus obscurus*)
4. Casey's June beetle (*Dinacoma caseyi*)
5. Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)
6. Delta green ground beetle (*Elaphrus viridis*)
7. El Segundo blue butterfly (*Euphilotes battoides allyni*)
8. Kern primrose sphinx moth (*Euproserpinus euterpe*)
9. Mission blue butterfly (*Icaricia icarioides missionensis*)
10. Monarch butterfly (*Danaus plexippus*) (Candidate Species)
11. Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*)
12. Oregon silverspot butterfly (*Speyeria zerene hippolyta*)
13. Quino checkerspot butterfly [*Euphydryas editha quino* (=*E. e. wrighti*)]
14. San Bruno elfin butterfly (*Callophrys mossii bayensis*)
15. Smith's blue butterfly (*Euphilotes enoptes smithi*)
16. Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

APPENDIX C

WILDLIFE MANAGEMENT METHODS USED AT CALIFORNIA AIRPORTS

Wildlife Services personnel use numerous methods to deter or remove wildlife from airports where they may pose hazards to aircraft. The table below lists the methods that are available for use at airports and the frequency of use across the project area.

Table C1. Wildlife Management Methods used on California Airports.[1,2,3]

Method	Anticipated Frequency of Use	Target Animal Group (Bird, Mammal)
Audio distress/predator calls	Common-daily	Both
Working Dogs	Less Common	Both
Eye-spot balloons, flags, and Mylar®	Less Common	Both
Inactive nest destruction	Seasonally	Birds
Lasers and lights	Less Common	Both
Paintball guns	Less Common	Both
Propane exploders/cannons	Seasonally	Both
Pyrotechnics	Common-Daily	Both
Scarecrows and effigies	Rare	Both
Vehicles	Common-Daily	Both
Radio controlled vehicles	Less common	Both
Injectable immobilizing and reversal drugs	Rare	Mammals
Tactile repellents/Taste	Rare	Birds
Air cannon nets	Rare	Both
Bal-chatri traps	Common-Daily	Birds-raptors
Beaver live-trap methods	Rare	Mammals
Bow nets/E-Z catch nets	Common-Daily	Birds
Cage traps	Common-Daily	Both
Cannon and rocket nets	Rare	Both
Corral traps	Rare	Both
Decoy traps	Common-Daily	Birds
Dho-gazza traps	Less common	Birds-raptors
Drop nets	Rare	Both
Foot/Leg Snares	Rare	Mammals

Method	Anticipated Frequency of Use	Target Animal Group (Bird, Mammal)
Funnel traps	Rare	Birds
Hand nets	Rare	Both
Mist nets	Rare	Birds
Nest box traps	Rare	Birds
Nest/walk-in traps	Rare	Birds
Net guns	Rare	Both
Padded-jaw foot-hold traps	Rare	Both
Phai hoop traps	Rare	Birds-raptors
Pigeon harnesses	Rare	Birds-raptors
Pole/Verbail traps	Common-Weekly	Birds-raptors
Swedish goshawk traps	Common-Weekly	Birds
Relocation	Various, as directed by Service and the California Department of Fish and Wildlife	Birds-raptors
Active nest destruction	Seasonally	Birds
Body grip	Rare (except LAX, Moffett)	Both
Egg addling/shaking	Seasonally	Birds
Neck/body snares	Less common	Mammals
Shooting	Common-Daily	Both
Snap traps	Less common	Both
DRC-1339	Rare	Birds
Egg oiling	Seasonally	Birds
Gas cartridges	Rare	Mammals
Zinc phosphide	Rare	Mammals
Carbon dioxide	Common-weekly	Both
Euthanasia solution	Less common	Mammals
Gunshot	Common-weekly	Mammals

[1] Description of methods available in *Biological Assessment: Wildlife Damage Management on Airfields in California,* Wildlife Services 2021.
[2] Frequency categories (*definition for frequency categories obtained from email from Shannon Chandler (APHIS-WS) to Damian Higgins, August 28, 2018, based on 2007-2017 level of use)* Daily = 4+ days per week; Weekly = 1+ days per week, 3 applications per month, and/or 50+ applications over 10 years; Less common = 3 or fewer applications per month, and 10–50 applications over 10 years; Rare: less than 10 applications over 10 years.
[3] Row color denotes frequency category.

APPENDIX D

"NO EFFECT" WILDLIFE MANAGEMENT METHODS USED AT CALIFORNIA AIRPORTS

Wildlife Services personnel use numerous methods to deter or remove wildlife from airports where they may pose hazards to aircraft. The table below lists the methods that Wildlife Services determined will have no effect on listed species due to targeted deployment, infrequency of use, or trap type.

Table D1. Wildlife management methods used at airports in California by Wildlife Services which have been determined to have "No Effect" on listed species.[1,2,3]

Wildlife Management Method	Anticipated Frequency of Use at Airports in California	Target Animal Group (Bird, Mammal)	WS Determination for Potential for Effect to Listed Species
Inactive nest destruction	Seasonally	Birds	NE
Paintball guns	Less Common	Both	NE
Injectable immobilizing and reversal drugs	Rare	Mammals	NE
Tactile repellents/Taste	Rare	Birds	NE
Air cannon nets	Rare	Both	NE
Beaver live-trap methods	Rare	Mammals	NE
Bow nets/E-Z catch nets	Common-Daily	Birds	NE
Cannon and rocket nets	Rare	Both	NE
Corral traps	Rare	Both	NE
Decoy traps	Common-Daily	Birds	
Dho-gazza traps	Less common	Birds-raptors	NE
Drop nets	Rare	Both	NE
Foot/Leg Snares	Rare	Mammals	NE
Funnel traps	Rare	Birds	NE
Hand nets	Rare	Both	NE
Nest box traps	Rare	Birds	NE
Nest/walk-in traps	Rare	Birds	NE
Net guns[6]	Rare	Both	NE
Phai hoop traps	Rare	Birds-raptors	NE
Pigeon harnesses	Rare	Birds-raptors	NE
Swedish goshawk traps	Common-Weekly	Birds	NE

Wildlife Management Method	Anticipated Frequency of Use at Airports in California	Target Animal Group (Bird, Mammal)	WS Determination for Potential for Effect to Listed Species
Relocation	Various, as directed by Service and the California Department of Fish and Wildlife.	Birds-raptors	NE
Active nest destruction[6]	Seasonally	Birds	NE
Body grip (conibear)	Rare	Both	NE
Egg addling/shaking[6]	Seasonally	Birds	NE
Neck/body snares	Less common	Mammals	NE
Shooting	Common-Daily	Both	NE
DRC-1339	Rare	Birds	NE
Egg oiling	Seasonally	Birds	NE
Gas cartridges	Rare	Mammals	NE
Zinc phosphide	Rare	Mammals	NE
Carbon dioxide	Common-weekly	Both	NE
Euthanasia solution	Less common	Mammals	NE
Gunshot	Common-weekly	Mammals	NE

[1] Description of methods available in *Biological Assessment: Wildlife Damage Management on Airfields in California,* Wildlife Services 2021.
[2] Frequency categories (*definition for frequency categories obtained from email from Shannon Chandler(APHIS-WS) to Damian Higgins, August 28, 2018, based on 2007-2017 level of use)'* Daily = 4+ days per week; Weekly = 1+ days per week, 3 applications per month, and/or 50+ applications over 10 years; Less common = 3 or fewer applications per month, and 10–50 applications over 10 years; Rare = less than 10 applications over 10 years.
[3] Row color denotes frequency category.

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer to:
FWS-SD-22-0070548-S7-I-R001

April 24, 2023
Sent Electronically

Dennis Orthmeyer
State Director – Wildlife Services
U.S. Department of Agriculture
Marketing and Regulatory Programs
3419-A Arden Way
Sacramento, California 95825

Subject: Amendment to Informal Section 7 Consultation for Wildlife Services California Wildlife Damage Management at Airfields in California

Dear Dennis Orthmeyer:

This responds to your request for clarification regarding the several Conservation Measures (CMs) outlined in the *Informal Section 7 Consultation for Wildlife Services California Wildlife Damage Management at Airfields in California* (Informal Consultation; 22-0070548-S7-I), which was emailed to Wildlife Services on December 16, 2022. During our January 20, 2023, conference call, you expressed concern that the Informal Consultation did not adequately recognize the periodic need for flexibility in implementation of CMs due to airport safety needs, unpredictability of wildlife behavior, and the dynamic conditions associated with wildlife damage management. We recognize that in certain instances, slight and temporary deviation from the CMs may be required to reduce wildlife conflict and maintain aircraft safety. This amendment addresses Wildlife Services' proposed changes to the project description and CMs to address the concerns identified above. We have included the complete list of CMs with amendments highlighted for ease of reference. These CMs supersede the CMs outlined in the original Informal Consultation (22-0070548-S7-I).

The Informal Consultation project description states that Wildlife Services personnel will travel on existing maintained roads. Existing maintained roads may include paved surfaces, dirt or gravel roads, or two-track roads used around the airfields. We acknowledge that there are instances when airfield safety or turn-around requirements may require temporary departure from existing maintained roads, and, therefore, amend the following statement in the project description (new language in red): "Wildlife Services personnel will travel on existing maintained roads to the maximum extent consistent with airfield safety."

In addition, Wildlife Services has proposed the following changes to the conservation measures (amendments in red).

CONSERVATION MEASURES

Training and contribution to ongoing resource inventories:

CM 1. Wildlife Services field personnel will be trained prior to working at airfields in California to ensure that they are familiar with the listed species that may inhabit the airfield and surrounding habitat, and the required conservation measures necessary to avoid the potential for adverse effects to these species. Existing Wildlife Services field personnel will be similarly trained within 6 months of finalization of this amended consultation. Field personnel will be required to sign a confirmation of training, and records that confirm completion of training will be maintained by Wildlife Services. Training will include an in-person or online live training by a qualified biologist with expertise about the species that inhabit the airfield and surrounding area. Training will also include a brochure, pamphlet, or webpage that includes:

a. A description and photographs of each listed species that may be present in, or within 200 feet of, the airfield boundary, including listed reptiles, amphibians, birds, mammals, plants, and invertebrates;

b. Maps outlining known listed species habitat on, or within 200 feet of, the airfield boundary;

c. Pictures and descriptions of the listed species habitat(s) present in, or within 200 feet of, the airfield boundary;

d. Information regarding the species status and observations of the species on the airfield and surrounding habitat, if any;

e. Species or airfield-specific conservation measures required to avoid and minimize potential for impacts to the listed species;

f. Maps and figures that depict buffer zones for use of radio-controlled vehicles, auditory deterrents, lasers, and traps;

g. General provisions of the Act and the requirement to adhere to the provisions of the Act; and

h. Contact information for the airfield environmental specialist or biologist(s), species specialists in the surrounding areas, and Service representatives.

CM 2. Wildlife Services field personnel will contribute to ongoing efforts to inventory and survey listed species at each airfield by actively searching for signs of listed species during routine Wildlife Services activities. Although Wildlife Services field personnel will not conduct protocol-driven listed species surveys, they will report incidental observations of the listed species to the local Service office and include details regarding observations in annual reports.

CM 3. Wildlife Services will submit a list that includes the name and contact information for field personnel stationed at each airfield to the local Service office and the installation/airfield biologist (or environmental specialist) on an annual basis. This information will facilitate coordination and information exchange regarding wildlife taxa.

Measures to reduce impacts from vehicle and pedestrian travel on airfields.

These measures will be implemented to the maximum extent possible consistent with airfield safety needs (i.e., in limited instances, personnel may be required to deviate from these measures to ensure airfield safety).

CM 4. Wildlife Services personnel will adhere to the posted speed limit or, where no speed limit is posted, (a) maintain a 15-mph speed limit in the project area unless in pursuit of a target individual (Odell 2022; pers. comm.), (b) operate vehicles on existing maintained roads, and (c) park within developed areas or the footprint of existing access roads.

CM 5. To the extent consistent with safety needs on the airfield, Wildlife Services personnel will walk on existing runways, taxiways, trails, and roads when conducting management activities.

CM 6. To the extent consistent with safety needs on the airfield, Wildlife Services will avoid night driving during or immediately after rain events to reduce the potential for vehicle impacts to amphibians.

CM 7. On airfields that could support desert tortoise, Wildlife Services field personnel will check under and adjacent to vehicles that have been parked prior to moving the vehicle. This includes the following airports: *China Lake Naval Air Station, Mojave Air and Space Port*. If a desert tortoise is found under a vehicle, that vehicle will not be moved until the tortoise has moved out from under the vehicle or been relocated by a permitted biologist.

Buffers to avoid exposure of listed animal species to disturbance or direct impact.

These measures will be implemented to the maximum extent consistent with airfield safety needs (i.e., in some instances, potential habitat may be present immediately adjacent to the runway or taxiway, and personnel may require flexibility to ensure aircraft safety).

CM 8. Wildlife Services personnel will maintain a 200-foot buffer between radio-controlled vehicle use areas and habitat potentially occupied by listed species. Use of radio-controlled vehicles will be minimized during the avian breeding season at all airports that support listed avian species nesting habitat.

CM 9. Wildlife Services field personnel will restrict use of auditory deterrents to daylight hours and maintain a 200-foot buffer between auditory deterrents and listed avian species habitat during the avian breeding season, except in the instance perceived risk to aviation safety. The breeding season may vary between listed bird species, so each airfield considered will have specific requirements to address the listed bird species that may be present in the vicinity of the airfield.

CM 10. Wildlife Services field personnel will direct lasers away from listed bird and mammal species habitat if these tools are used to haze wildlife. Each airfield will identify listed bird and mammal species habitat in airfield-specific training materials (as per CM 1).

CM 11. Wildlife Services field personnel will maintain a minimum 200-foot buffer between traps and listed species habitat. Each airfield will identify listed species habitat in airfield-specific training materials (as per CM 1).

Special considerations for trap use at airports that support listed mammals, reptiles, and amphibians.

CM 12. Wildlife Services will not use gas cartridges and snap traps at airports that may support listed mammals, reptiles, or amphibians without further coordination with the Service. This includes the following airports: *Edwards Air Force Base, French Valley Airport, Hemet-Ryan Airport, Lemoore Naval Air Station, March Air Force Base, Metropolitan Oakland International Airport, Moffett Federal Airfield, Ontario International Airport, San Bernardino International Airport, Bakersfield Municipal Airport, Byron Airport, Meadows Field Airport, Ramona Airport, San Bernardino International Airport, Travis Airforce Base, Vandenburg Airforce Base, Camp Roberts East Garrison, McMillan Army Airfield, China Lake Naval Air Station, Kingdon Airpark, Mojave Air and Space Port, Monterey Regional Airport, Napa County Airport, and Stockton Metropolitan Airport.*

CM 13. Wildlife Services personnel will not use neck/body snares or padded leghold traps at the following airports, where San Joaquin kit fox could be present, without further coordination with the Service: *Bakersfield Municipal Airport, Byron Airport, Camp Roberts East Garrison, McMillan Army Airfield, and Meadows Field Airport*.

CM 14. At Lemoore Naval Air Station, where padded leghold traps may periodically be necessary to exclude coyotes from the airfield, Wildlife Services will increase pan tension to ensure that the traps exclude San Joaquin kit fox.

CM 15. Wildlife Services will coordinate with the Service if cage trapping is deemed necessary at airports where San Joaquin kit fox could be present and will limit any necessary cage trapping to the months of September–January (i.e., outside natal season) to reduce the potential for capture of a San Joaquin kit fox. This includes the following airports: *Bakersfield Municipal Airport, Byron Airport, Camp Roberts East Garrison, Lemoore Naval Air Station, McMillan Army Airfield, and Meadows Field Airport*.

CM 16. If cage traps are used that have potential to trap kit foxes (e.g., size 10-inch by 10-inch or larger), Wildlife Services will conduct trap checks at least once every 16 hours and will include a bite bar to reduce the potential for injury to San Joaquin kit fox at the following airports: *Bakersfield Municipal Airport, Byron Airport, Camp Roberts East Garrison, Lemoore Naval Air Station, McMillan Army Airfield, and Meadows Field Airport*. If a kit fox is captured, Wildlife Services will discontinue trapping and contact the Service to reinitiate consultation.

CM 17. Wildlife Services field personnel will use trained dogs for dispersal of target wildlife only within the operational area of the airfield. Working dogs will be under direct control of the trainer at all times. When consistent with wildlife damage management requirements, working dogs will remain 200 feet from potentially occupied listed species habitat.

CM 18. Wildlife Services will coordinate with the Service on an annual basis and provide an annual report by December 31 each calendar year that includes: (a) a table of species harassed/relocated or lethally removed; (b) a report of Threatened and Endangered species sightings, if any; (c) a report of activities occurring within designated habitat areas (e.g., retrieval of dead wildlife within mapped area); and (d) general information regarding level and locations of trapping and harassment necessary to achieve wildlife damage management objectives.

These amendments do not change our conclusions that wildlife damage management proposed for airports in California is not likely to adversely affect the species included in the Informal Consultation. In addition, we will mutually evaluate the potential effects to listed species annually by reviewing the annual report that outlines wildlife damage management activities at each covered airfield, and Wildlife Services will re-initiate consultation if project plans change or if additional information on the distribution of listed or proposed species or effects of management activities becomes available. Thank you for your coordination, and please let us know if you have additional questions. We look forward to continuing to work with you as you develop the educational materials and training programs to equip your staff at airfields in California. If you have any questions or concerns regarding this consultation, please contact the appropriate U.S. Fish and Wildlife Service office (Tables 3, 4) or Sandy Vissman[1] at 760-431-9440, extension 274.

Sincerely,

JONATHAN SNYDER
Digitally signed by JONATHAN SNYDER
Date: 2023.04.24 09:08:07 -07'00'

Jonathan D. Snyder
Assistant Field Supervisor

[1] Sandy_Vissman@fws.gov

BIOLOGICAL ASSESSMENT

USDA
Animal and Plant Health Inspection Service,
Wildlife Services

Predator Damage Management
To Benefit Coastal Threatened and Endangered Species
In the State of California

Prepared by:
U. S. Department of Agriculture,
Animal and Plant Health Inspection Service
APHIS-WS, Sacramento, California
Original submission 2004
April 2009 revision
May 2016 revision
January 2017 revision
July 2017 revision
May 2018

Contents

Tables

LIST OF ACRONYMS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BA	Biological Assessment
BBS	Breeding Bird Survey
BCR	Bird Conservation Region
BLM	Bureau of Land Management
CACR	California clapper rail
CDFW	California Department of Fish and Wildlife
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
LETE	California least tern
LFCR	Light-footed clapper rail
MAMU	Marbled murrelet
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
PDMTE	Predator Damage Management to benefit Threatened and Endangered Species
SMHM	Salt marsh harvest mouse
T&E	Threatened and Endangered
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WSPL	Western snowy plover
WS	Wildlife Services

INTRODUCTION

This Biological Assessment (BA) discusses and evaluates APHIS-WS' Predator Damage Management to Benefit Threatened and Endangered Species (PDMTE) activities in coastal areas of California for potential effects on the federally listed threatened and endangered species APHIS-WS protects and critical habitat associated with those species. The BA is an updated version of the July 2004 BA submitted to the U.S. Fish and Wildlife Service for review (revision occurred in April 2009, May 2016, January 2017, and March 2017).

Scope

This BA discusses APHIS-WS actions taken in California to protect coastal T&E species from predation or other wildlife threats. This BA covers APHIS-WS PDMTE protection efforts for **California clapper rail** (*Rallus longirostris obsoletus)*, **California least tern** (*Sterna antillarum browni)*, **Light-footed clapper rail** (*Rallus longirostris levipes)*, **Marbled murrelet** (*Brachyramphus marmoratus)*, **Western snowy plover** (*Charadruis nivosus ssp. nivosus)*, and **Salt marsh harvest mouse** (*Reithrodontomys raviventris)*.

APHIS-WS is not a land or resource management agency and does not decide to implement actions to protect listed species on its own. APHIS-WS implements PDMTE at the request of federal, state, and private conservation land managers. These actions occur where predator management is part of a conservation, mitigation, or recovery plan encompassing the area or species protected.

Lands managed for conservation provide essential habitat for a variety of federally threatened and endangered species (T&E). The decline in the population of many of these species has been attributed to habitat loss, the introduction of exotic species populations, water and air pollution, habitat degradation, and human disturbance. Without human intervention, it is likely that some of these species will not survive. Reproductive success is strongly influenced by food availability, quality of breeding habitat, and predation pressure. Controlling the numbers of predators in T&E species habitats is the main variable that humans can directly control in a localized context. Therefore, management to reduce the potential for significant losses of T&E species due to predation on nesting grounds or other crucial habitat areas is an essential wildlife conservation goal (USFWS 2008).

When requested by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), conservation organizations, or private landowners, APHIS-WS may implement Predator Damage Management (PDM) activities to protect natural resources including T&E Species. APHIS-WS works closely with land managers to monitor the effects of predation on listed species where APHIS-WS implements PDMTE. This BA evaluates the use of PDMTE methods for effects on the T&E species protected by these actions.

Project Objectives

- Support the recovery and protection efforts for Federal threatened and endangered species and their habitats, by providing effective predator management when requested by land managers.

Authorities

APHIS-WS is authorized by Congress to protect American resources from damage associated with wildlife, which includes the protection of endangered species. The Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426) states: "The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program…."

The Act was amended in 1987 (Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c) to further provide: "On or after December 22, 1987, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

Consultation History

APHIS-WS has a long history of consultation with the USFWS for compliance with the Endangered Species Act (ESA). This BA is an updated version of the July 2004 BA submitted to the U.S. Fish and Wildlife Service. Revisions occurred in April 2009, May 2016, January 2017, and March 2017 to include changes in the program methods, locations, species protected, and species status. This document replaces all previous submissions for PDMTE involving California clapper rail, California least tern, Light-footed clapper rail, Marbled murrelet, Western snowy plover, and Salt marsh harvest mouse.

PROJECT DESCRIPTION

Project Justification

At the request of land and resource managers, APHIS-WS implements PDMTE activities to alleviate damage from avian, mammalian, and/or reptilian predators on a local population in localized areas. To accomplish this APHIS-WS will identify individuals or groups of animals that may harm the protected species and choose the most effective, selective, and humane methods legally available to deter or remove the species that threaten the protected species. The strategies would include education and advice, as well as, non-lethal and lethal methods.

APHIS-WS works closely with both federal and state agencies to identify wildlife or feral species negatively affecting T&E species. During this process APHIS-WS reviews species specific recovery plans and other pertinent information to incorporate biological information into the approach for addressing T&E predation. The need for appropriate predator management in waterbird and shorebird nesting areas is listed as a population conservation issue for waterbirds, as addressed in the North American Waterbird Conservation Plan (Kushlan et al. 2002) and the priority conservation action for shorebirds, as outlined in the Southern Pacific Shorebird Conservation Plan (Hickey et al. 2003). (See Appendix C for a list of Summaries of Related

Recovery Plans). APHIS-WS commenced predator management activities to benefit least terns in the 1980's. Their involvement resulted from monitors identifying predation of chicks as the main factor of poor breeding success rather than reduced habitat and pair disturbance (Collins 1984; Frost 2015).

For species also affected by habitat loss, predation potential may sharply increase as predator foraging activities become focused on smaller areas of remaining habitat. Additionally, urban development has created conditions that are advantageous to many native, generalist predators resulting in larger populations of some predator species than were present historically. Peridomestic species, such as raccoons, skunks, opossum, and feral dogs and cats, are found at higher densities in human developed areas than natural habitats and can be found in abundance on conservation lands bordering development. Their presence negatively impacts the viability of these conservation lands for supporting endangered species.

Project Location

APHIS-WS PDMTE activities in Coastal areas are a programmatic approach to addressing T&E predation concerns. APHIS-WS actions are targeted at protecting T&E species from individual predators at breeding/nest sites for migratory species (LETE, MAMU, & WSPL) and year round for site restricted species (CLRA, LFCR, & SMHM). As such, APHIS-WS must work in T&E species habitat and including breeding/nesting areas when conducting PDMTE actions.

Many of the species addressed in this BA have large ranges along the California coast (*see Table 1*) and use scattered sites within their range where suitable habitat exists. Federal, state, local, and private land/resource managers monitor these populations for threats and mortality events. While current program activities (See Appendix A) are a good indicator of where APHIS-WS will continue to be asked to assist with PDMTE in the future, requests could come from anywhere in the nineteen California coastal counties (Alameda, Contra Costa, Del Norte, Humboldt, Los Angeles, Marin, Mendocino, Monterey, Napa, San Francisco, San Diego, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, and Ventura counties). The effects of predation on T&E sites are often sporadic, locally intense, and difficult to predict. APHIS-WS is often contacted for assistance when acceptable predation thresholds have already been surpassed and there is a significant threat to the local breeding population. As such, PDMTE is often a reactionary action in response to a real time predation event. As with most emergency interventions, whenever requested APHIS-WS must be ready to provide assistance on short notice anywhere in California's coastal counties to protect the species addressed in this BA. Using this approach, the analyses in this BA are intended to apply to PDMTE actions that may occur in any locale and at any time within California's coastal counties for which USDA-WS assistance has been requested to protect the six T&E species addressed in this BA.

Site specific decisions for methods selection and application of PDMTE activities are addressed using the WS Decision Model for field operations and preseason meetings or discussion with land/resource managers. APHIS-WS signs annual agreements with each land manager outlining the predator species to be targeted and what methods are approved for use on each site.

Table 1. Status and range of species protected by APHIS-WS PDMTE addressed in this BA.			
Common Name	**Scientific Name**	**Status**	**Counties of Occurrence**
California clapper rail (CLRA)	*Rallus longirostris obsoletus*	E	Alameda, Contra Costa, Humboldt, Marin, Mendocino, Monterey, Napa, Sacramento*, San Benito*, San Francisco, San Joaquin*, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma
California least tern (LETE)	*Sterna antillarum browni*	E	Alameda, Contra Costa, Los Angeles, Marin, Monterey, Napa, Orange, Sacramento*, San Benito*, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus*, Ventura
Light-footed clapper rail (LFCR)	*Rallus longirostris levipes*	E	Los Angeles, Orange, San Diego, Santa Barbara, Ventura
Marbled murrelet (MAMU)	*Brachyramphus marmoratus*	T	Del Norte, Humboldt, Los Angeles, Marin, Mendocino, Monterey, San Benito, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Siskiyou*, Sonoma, Trinity*, Ventura
Western snowy plover (WSPL)	*Charadruis nivosus ssp. nivosus*	T	Alameda, Contra Costa, Del Norte, Humboldt, Imperial*, Inyo*, Kern*, Kings*, Los Angeles, Marin, Mendocino, Monterey, Napa, Orange, Riverside*, San Bernardino*, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, Sutter*, Tulare*, Ventura, Yolo*
Salt marsh harvest mouse (SMHM)	*Reithrodontomys raviventris*	E	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma
"*" Denotes county that is not part of Coastal area evaluated in this BA.			

Target Species

Predation from abundant common predatory species may act as a limiting factor in the recovery of sensitive, threatened, or endangered species (i.e. gull predation on western snowy plovers and California least terns and fox predation on western snowy plover eggs). Gulls pose a special threat to breeding western snowy plovers because they not only depredate nests and chicks, but also usurp and trample western snowy plover nesting habitat and crush eggs (Widrig 1980, Page et al. 1983, Persons and Applegate 1997, J. Albertson 1999, Point Reyes Bird Observatory unpublished data, USFWS 2007). Red foxes have been identified as a significant predator of western snowy plover eggs in the Monterey Bay area, where they are suspected of also preying on adults and chicks (USFWS 2007). Avian, mammalian, and reptilian predators known to predate on coastal T&E species and targeted by PDMTE activities covered in this BA are listed in Table 2.

Table 2. List of Avian, Mammalian, and Reptilian Predators			
Avian - Common Name	**Scientific Name**	**Mammalian - Common Name**	**Scientific Name**
American Crow	*Corvus brachyrhynchos*	Black Rat	*Rattus rattus*
American Kestrel	*Falco sparverius*	Black-tailed Jack Rabbits	*Lepus californicus*
Barn Owl	*Tyto alba*	Bobcat	*Felis rufus*
Black-crowned Night-heron	*Nycticorax nycticorax*	Botta's Pocket Gopher	*Thomomys bottae*
Burrowing Owl	*Athene cunicularia*	California Ground Squirrel	*Otospermophilus beecheyi*
California Gull	*Larus californicus*	Cottontail rabbits	*Sylvilagus audubonii*

Caspian Tern	*Hydroprogne caspia*	Coyote	*Canis latrans*
Common Raven	*Corvus corax*	Deer Mice	*Peromyscus maniculatus*
Cooper's Hawk	*Accipiter cooperii*	Desert Woodrat	*Neotoma lepida*
European Starling	*Sternus vulgaris*	Feral Cats	*Felis domesticus*
Forster's Tern	*Sterna forsteri*	Feral Dog	*Canis domesticus*
Glaucous-winged Gull	*Larus glaucesens*	Gray Fox	*Urocyon cinereoargenteus*
Gray Jay	*Perisoreus canadensis*	Long Tailed Weasel	*Mustela frenata*
Great-tailed Grackles	*Quiscalus mexicanus*	Mink	*Mustela vison*
Great Blue Heron	*Ardea herodias*	Norway Rat	*Rattus norvegicus*
Great Egret	*Ardea alba*	Raccoon	*Procyon lotor*
Great Horned Owl	*Bubo virginianus*	Red Fox	*Vulpes vulpes*
Greater Roadrunner	*Geococcyx californianus*	Short Tailed Weasel	*Mustela erminia*
Gull-billed Tern	*Gelochelidon nilotica*	Shrew	*Soricidae*
Gyrfalcon	*Falco rusticolus*	Spotted Skunk	*Spilogale gracilis*
Heermann's Gull	*Larus heermanni*	Striped Skunk	*Mephitis mephitis*
Herring Gull	*Larus argentatus*	Virginia Opossum	*Didelphis virginiana*
Horned Lark	*Eremophila alpestris*		
Loggerheaded Shrike	*Lanius ludovivianus*	**Reptilian - Common Name**	**Scientific Name**
Long-eared Owl	*Asio otus*	California King Snake	*Lampropeltis getula californiae*
Merlin	*Falco columbarius*	California Garter Snake	*Thamnophis sirtalis*
Northern Harrier	*Circus cyaneus*	Pacific Gopher Snake	*Pituophis catenifer*
Osprey	*Pandion haliaetus*	Southern Pacific Rattlesnake	*Crotalus oreganus*
Peregrine Falcon	*Falco peregrinus*	Western Diamond Rattlesnake	*Crotalus atrox*
Red-shouldered Hawk	*Buteo lineatus*		
Red-tailed Hawk	*Buteo jamaicensis*		
Ring-billed Gull	*Larus delawarensis*		
Rock Pigeon	*Columba livia*		
Sharp-shinned Hawk	*Accipiter striatus*		
Short-eared Owl	*Asio flammeus*		
Snowy Egret	*Egretta thula*		
Steller's Jay	*Cyanocitta stelleri*		
Turkey Vulture	*Cathartes aura*		
Western Gull	*Larus occidentalis*		
Western Meadowlark	*Sturnella neglecta*		
Western Scrub Jay	*Aphelocoma californica*		
White-tailed Kite	*Elanus leucurus*		

WS Method Selection

In selecting damage management techniques for PDMTE, consideration would be given to the damage causing species and the magnitude, geographic extent, duration, frequency, and likelihood of said damage. Consideration would also be given to the status of target and potential non-target species, local environmental conditions and impacts, social and legal aspects of damage reduction options. The cost of damage reduction is a secondary concern in the protection of T&E species because of the overriding environmental and legal considerations.

A variety of methods would potentially be available to the APHIS-WS program in California relative to the management or reduction of predation on coastal T&E species. Various federal, state, and local statutes and regulations and APHIS-WS directives would govern APHIS-WS' use of damage management methods. APHIS-WS would develop and recommend or implement strategies based on resource management, physical exclusion, and wildlife management approaches. Within each approach there may be available a number of specific methods or techniques.

When selecting a specific course of action, the APHIS-WS Policy Manual requires that a range of management approaches and alternatives be evaluated. In order to do this, APHIS-WS managers, biologists, and specialists use the Decision Model when responding to all requests for assistance with wildlife conflicts. The Decision Model (see Figure 1) bases a determination of the appropriate damage management method(s) to implement on several factors: (1) species responsible, (2) magnitude, geographic extent, frequency, historical damage, and duration of the problem, (3) status of target and non-target species, (4) environmental conditions, (5) potential biological, physical, economic, and social impacts, (6) potential legal restrictions, and (7) costs of damage management options (WS Directive 2.101 and 2.201).

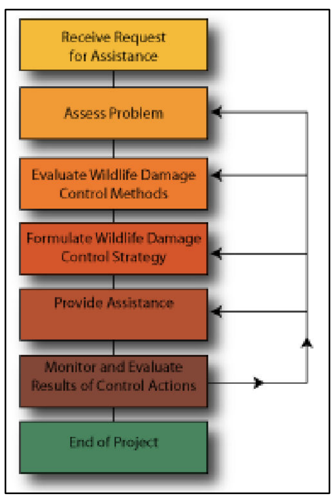

Figure 1
WS Decision Model

Per APHIS-WS policy 2.101, APHIS-WS personnel give preference to nonlethal methods when practical and effective. Although they consider the costs associated with implementing a particular method(s), APHIS-WS personnel also consider other factors based on social values (selectivity and humaneness), legal factors, the species involved, etc. The primary goal of the program is not necessarily to be as cost effective as possible, but rather to conduct program activities in a biologically sound, environmentally safe, and sustainable manner.

With regards to PDMTE, APHIS-WS is frequently contacted after land managers have tried multiple nonlethal techniques and are still experiencing loses. APHIS-WS personnel evaluate the appropriateness of available strategies and methods based on biological, economic, and social considerations. Following this evaluation, the methods deemed practical for the situation are formed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluations continue assessing the effectiveness of the PDMTE strategy.

The recommended solution may include any combination of preventive and corrective actions that could be implemented by the resource owner, APHIS-WS, or other agency personnel, as appropriate. As when resolving other types of wildlife conflicts, the strategies used by APHIS-WS personnel to resolve predation on T&E species include technical assistance (education, information and advice) and field assistance.

- **Technical Assistance** is a primary method used in responding to early requests for assistance. Individuals calling for assistance are given advice and information on ways to reduce predation on T&E species. The implementation of technical assistance recommendations is the responsibility of the requester based on information, demonstrations, and advice on available and appropriate wildlife damage management methods provided by APHIS-WS personnel. Technical assistance includes demonstrations on the proper use of management devices (i.e., pyrotechnics, exclusionary devices, cage traps, etc.) and information on animal husbandry, habitat management, and animal behavior modification that could reduce predation. Technical assistance is provided following consultation or an on-site visit with the requester, and generally several management strategies are described to the requester for short and long-term solutions to predation problems; these strategies are based on the level of risk, need, and practical application.
- **Field Assistance** is initiated when the problem cannot effectively be resolved through technical assistance alone and typically when the resource owner/Agency has implemented nonlethal actions and predation continues. Field assistance could be provided for situations that require the use of methods and techniques that are challenging or unsuitable for the public or other agency to implement on their own. Resource owners/Agencies that are provided field assistance are also encouraged to use additional management strategies and sound husbandry practices, when and where appropriate, that could potentially further reduce predation. Field activities may include but are not limited to the monitoring, trapping, dispersal, and removal of wildlife causing predation.

Technical Assistance

APHIS-WS does not implement any technical assistance actions for PDMTE. After field visits and review of predation issues, APHIS-WS may make recommendations to a land manager regarding technical assistance actions to reduce the occurrence of predation on T&E sites. APHIS-WS is not the implementer of these actions nor the approver. The land manager is responsible for evaluation the need and possible impacts of these actions prior to implementation. As such, technical assistance actions are included in this BA as a possibly related activity, however, APHIS-WS recommendation does not mean the action is guaranteed to be carried out.

Modification of Human Behavior may be recommend to resolve potential conflicts between humans and wildlife. For example, APHIS-WS recommends the elimination of feeding wildlife both inadvertent feeding (i.e. improper disposal of garbage/storage of camp food, outdoor pet feeding, and feeding of cat colonies) and intentional feeding of wildlife by uniformed members of the public. Peridomestic wildlife species (such as Raccoons and Striped skunks) adapt well to living near humans, and studies have shown increased density of mesocarnivore species along the urbanization gradient in part because of capitalization on anthropogenic food sources (Salek et al. 2015). Unnatural densities of these species in proximity to conservation lands may result in damage to threatened and endangered species. Even with considerable effort from land managers, it can be difficult to consistently enforce no-feeding regulations and to effectively educate all people concerning the potential liabilities of feeding wildlife. APHIS-WS is not a regulatory agency or land manager and as such cannot mandate changes in human behavior or restrict the movement of people in or around T&E sites. APHIS-WS is not the implementer of this action, so this BA does not address the effects of human behavior modification.

Habitat modification can be an integral part of predator management. Wildlife production and/or presence are often directly related to the type, quality, and quantity of suitable habitat. Properly managed, suitable habitat of sufficient size must be available for nesting purposes; foraging, roosting, and wintering habitat must be preserved and properly managed (USFWS 1985a). Therefore, habitat can be managed to reduce or eliminate the production or attraction of certain bird species or to repel certain birds (e.g. removal of weeds surrounding a California least tern colony or a pole used by perching raptors to hunt rail species). While APHIS-WS may recommend or be consulted on the types of modifications that could be implemented to lessen predation, in all cases, the property owner would be responsible for evaluating and implementing habitat modifications. APHIS-WS does not modify habitat, so this BA does not address the effects of habitat modification.

Physical Exclusion Methods can be used in some situation to restrict predators from accessing areas where T&E species inhabit. Use of exclusion methods for T&E species protection largely depends on the size and behavior of the protected species and predators. When compatible with T&E species biology, these methods provide a means of appropriate and effective prevention of site specific predation problems. APHIS-WS does not construct physical exclusion devices on PDMTE sites, so this BA does not address the effects of habitat modification.

> **Electric Fencing** could be recommended by APHIS-WS to alleviate damage caused by wildlife. The application of electrified fencing would generally be limited to site specific application where predation is occurring in a very limited geographic scale. Limits of this application arise where there are multiple landowners along the wetland, pond, or lake, the size of the area, and its proximity to bodies of water. Predator control through judicious use and placement of electric fences and other barriers as well as by trapping efforts have reduced losses of adults, eggs, and/or young (USFWS 1985a). While electric fencing may be effective in repelling predators in some urban settings, its use is often prohibited in many municipalities for human safety reasons. Problems that typically reduce the effectiveness of electric fences include vegetation on fence, flight capable birds, fencing knocked down by other animals (e.g., white-tailed deer and dogs), and poor power.

Barrier Fencing could also be recommended by APHIS-WS to prevent site specific predation. Exclusion fencing is mainly used to protect nesting colonies or individual nests from mammalian predators. The application of this method would be limited to small areas, such as tern colonies and individual western snowy plover nests that could be completely enclosed. After enclosures and mammalian predator control came into use to protect nests around Monterey Bay, annual clutch hatching rates have climbed from 43 to 68 percent (Neuman et al. 2004; USFWS 2007). Fences constructed of woven wire can be effective in some areas for wildlife, but fencing does have limitations. Some fences inadvertently trap, affect the movement of non-target wildlife, or impede the use of areas by some wildlife species. The use of these methods must be carefully considered especially in areas where migratory mammals, such as deer and elk, pass. Materials and construction must be carefully selected to prevent access by predatory species but be permeable to the T&E species.

Barricades of various kinds are used to exclude bobcats, coyotes, foxes, opossums, raccoons, or skunks from areas. Sheathing or tree protectors could be used in some situations to prevent access to trees canopies but may be impractical where there are numerous trees present.

Surface Coverings could be recommended by APHIS-WS to provide hides for T&E species and decrease the success rate of predator detection. For example, clay roof tiles have been placed within California least tern colonies to act as chick shelters (USFWS 2006b).

Field Assistance Methods

Field application of a PDMTE program by APHIS-WS personal requires specialized equipment (i.e. pyrotechnics, specialized traps, and federal approved firearms) and training. The cost and required expertise or training often preclude their use by agency personnel or private citizens not solely dedicated to wildlife conflict management.

Site Presence/Access

All APHIS-WS PDMTE actions require visitation of areas frequented by T&E species including their sensitive breeding and nesting habitat. APHIS-WS personnel are trained to identify T&E species and access their behavior. PDMTE is conducted for the overall benefit of the protected species, and APHIS-WS considers the needs and response of T&E species while selecting and applying methods for their protection. The intent of the PDMTE is to remove the foraging predator from the area, limiting its potential to cause disturbance to the protected species on site, decreasing protected species adult mortality, and increasing T&E population recruitment. Application of predator management actions in sensitive areas is done with great consideration for the possible disturbance these techniques may create. APHIS-WS consults with site monitors and land managers and takes all appropriate site specific training before entering threatened or endangered species habitat (e.g. USFWS "Walking in the Marsh"). Even when using extreme caution, APHIS-WS presence on site, as with the presence of site monitors, has the potential to influence the behavior of the species being protected by the PDMTE actions. Site and species specific minimization measures addressed further in this BA, are designed to minimize any disturbance caused by APHIS-WS presence on site.

APHIS-WS PDMTE actions have been carried out in California for more than 25 years with no step/crush incidents of California clapper rail, California least tern, Light-footed ridgeway rail, Marbled murrelet, Salt marsh harvest mouse, or Western snowy plover. The land manager has oversite of the frequency of entry and overall management of the all sites where APHIS-WS conducts PDMTE. APHIS-WS minimizes entry to the fullest extent possible when conducting PDMTE actions. Even when using extreme caution the exact locations of individual T&E animals or nests on site are rarely known. Despite the lack of historical take, the potential of flushing an incubating individual or stepping on a well camouflaged and previously undocumented nest is exceeding rare but possible.

APHIS-WS commonly uses trucks and ATVs to access T&E protection sites. During periods of extreme tides or significant rain, APHIS-WS may use motorized and non-motorized boats to access sites for PDMTE actions. Transportation methods, routes and parking locations are discussed with land managers and site monitors in preseason meetings that address site-specific concerns for APHIS-WS PDMTE. As such, APHIS-WS vehicles and transportation do not present a hazard for the protected species on T&E sites.

Avian PDMTE Methods

The following methods are used to target avian predators in the course of PDMTE activities addressed in this BA. The intent of the utilized method(s) is to remove the damaging predatory species from the area to decrease adult mortality and increase population recruitment. APHIS-WS minimizes entry to the fullest extent possible to deliver reptilian PDMTE.

Dispersal and Deterrent Devices rely on the use of sound, lights, pursuit or other methods to disperse animals from the area to be protected. The success of frightening methods depends on animals' fear of, and subsequent aversion to offensive stimuli. Once animals become habituated to a stimulus, they often resume their damaging activities. Persistent effort is usually required to consistently apply frightening techniques and then vary them sufficiently to prolong their effectiveness. Over time, some animals learn to ignore commonly used scare tactics that are no longer perceived as threats. In many cases animals frightened from one location become a problem at another. The application of dispersal and deterrent devices for T&E protection work is limited by potential effects of the frightening devices on the T&E species being protected as well as other non-target wildlife in the area. APHIS-WS uses caution and consults with site monitors and land managers when applying any equipment in or near nesting/breeding sites. Types of dispersal and deterrent devices include:

- **Pyrotechnics, shell-crackers and scare cartridges** are commonly used to repel wildlife. Shell-crackers are 12 gauge shotgun shells containing firecrackers that are projected up to 200 feet in the air before exploding. They can be used to frighten wildlife and are most often used to drive foraging predators farther away from a threatened or endangered species site. The purpose is to produce an explosion between the animal and their objective, the sensitive species. Noise bombs and whistler are fired from 15 millimeter flare pistols. They are used similarly to shell-crackers but are projected for shorter distances. Noise bombs are firecrackers that travel about 75-100 feet before exploding. Whistler are similar to noise bombs, but whistle in flight but do not explode. They produce a noticeable response because of the trail of smoke and fire, as well as the whistling sound. APHIS-WS uses caution when choosing to apply any noise emitting device for the purpose of T&E protection. APHIS-WS personnel must weigh the predation risk and disturbance being caused by the actively foraging predator with the potential effects of the dispersal method being applied. Pyrotechnics have successfully been used to disperse Peregrine falcons that are actively swooping on least tern colonies. APHIS-WS staff must work quickly to deter the predator before it creates panic in the colony causing the breeding terns to take flight. APHIS-WS staff attempt to deploy the pyrotechnic away from the colony at the maximum distance of the predator's circle in order to drive the predator away from the T&E site. Pyrotechnics may be chosen for application when the predator foraging on the T&E site cannot safely be lethally removed immediately, nonlethal methods are mandated before lethal by MBTA permitting, or the site/land manager chooses not to use lethal control on a specific predator species.

- **Lasers** have a narrow targeted beam that causes a temporary blinding effect which elicits a flight response. The narrow beam is only visible at the source and target unless conditions are foggy limiting the laser's effect on nontarget animals in the vicinity. Lasers have shown some effectiveness with dispersing gulls, vultures, and crows (USDA 2001). Best results are achieved under low-light conditions (i.e. sunset through dawn) and targeting structures or trees proximate to roosting birds, thereby reflecting the beam (USDA 2001).When used repeatedly target animals become rapidly accustomed to such lights and their long-term effectiveness is questionable.

- **Scarecrows and Effigies** often depict predator animals (e.g., alligators, owls), people, or mimic distressed target species (e.g., dead ravens, dead crows) and they are intended to elicit a flight response from target birds, which disperses those birds from the area. Avery et al. (2008) found that effigies could be effective as dispersing crows. When crow aggregations are relatively small, then effigies might suffice, but for large roosts it is likely that reinforcement with additional methods such as pyrotechnics or distress calls will be needed (Avery et al. 2008). Crow or raven effigies are mainly used to protect nesting colonies or individual nests from avian predators. In general, scarecrows would be most effective when they were moved frequently, alternated with other methods, and were well maintained. However, scarecrows tend to lose effectiveness over time and become less effective as populations increase (Smith et al. 1999) however, they have been used effectively to deter raptors from establishing nests on certain power structures by mimicking utility staff accessing the tower. For the purposes of T&E protection, scarecrow and effigy applications are limited to locations where their presence does not disturb the species being protected. Effigies could be used to disperse corvid roosts in proximity to T&E sites or to deter avian predators from using certain structures to hunt the T&E species provided the application location is out of sight of the species being protected or it is determined by site monitors/land managers that the effigy would not cause a disturbance of the protected species.

Live-Capture Traps/Tools come in a variety of styles to target avian species. All of the live capture traps have the ability to give APHIS-WS personal the opportunity to relocate depredating predator animals however the relocation of target animals involved in conflicts is prohibited according to State wildlife policy. California Department of Fish and Wildlife (CDFW) Manual No. 679 (Wildlife Rehabilitation and Care Standards) does not authorize nuisance wildlife relocation. CDFW, Fish and Game Commission Title 14 also states in section 671.6 (a) that "No person shall release into the wild without written permission of the commission any wild animal" (as defined by section 2116 of the Fish and Game Code). Except under limited circumstances, approved by the CDFW and USFWS (if migratory bird), APHIS-WS does not relocate wildlife. All APHIS-WS traps are checked at least daily in accordance with state law.

- **Cage traps** are the most common type of trap used for wildlife capture. Cage traps are usually rectangular and made from heavy gauge wire mesh. Cage traps capture the animal by mechanical closure of the entry way via the animal's actuation of a triggering device. The most common cage trap trigger mechanism is a treadle trigger which can be adjusted so that animals over a certain weight trigger the trap. Cage traps are constructed out of mesh or plastic with vents that can be sized to allow small rodents or birds to pass through the trap without restriction. These traps are used to capture animals alive and can often be used where lethal tools could be hazardous, upsetting, or the disposition of similarly sized animals may be different by species. Cage traps are well suited for use in residential or fringe areas where free ranging, nontarget domestic animals (ie cats and small dogs) are common. These live capture devices allow for the animal to be released unharmed or transferred to a local animal services department if captured in sensitive T&E species habitat.
- **Padded-jaw foot-hold traps** come in different sizes to allow for effective and safe capture of differently sized target species. They are a two coil spring trap with rotating padded jaws which are buried in the ground along a known predator travel path or corridor. The jaws are padded with non-hardening rubber designed to close on an animal's foot and hold without injuring. APHIS-WS uses these traps with centrally attached inline shock springs and swivels to allow for movement and prevent leg injuries. These traps have adjustable pan tension triggers which can be measured with a pan scale device and finely adjusted to exclude animals smaller than the target species. Pan tension devices only trigger when adequate weight is on the pan. Smaller species can step on the pan without triggering the device. Although prohibited for recreational and commercial purposes, padded-jaw foot-hold traps can be used in California for the protection of public safety and Threatened and Endangered species. (In Nat. Audubon Society v. Davis (N.D.Cal. 2000) 144 F.Supp.2d 1160, the United States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of padded-jaw traps for the protection of endangered species.)
- **Pole traps (Verbail or modified padded-jaw foot-hold traps)** are traps on the top of a pole and are primarily use to capture raptors. "Pole traps are live traps that can be effective and humane tools for alleviating certain problems caused by raptors" (USFWS 2005). Depending on species being trapped, the modified padded-jaw foot-hold trap size, pole height, trap placement, and trap location are all taken into consideration by APHIS-WS personnel prior to setting. The padded-jaw foot-hold traps is highly modified with the original springs either replaced or weakened in addition to having off-set jaws, which give more room for the animal's foot to move, and either surgical tubing or foam rubber securely attached to the already rubberized jaw for extra padding. Traps are attached to a guide rod or thick wire that runs from the trap down the pole to the ground. Once an animal is captured, the trap and raptor slide down the guide to the ground for handling. A Verbail trap consist of a platform or stand wrapped with a nylon cord and associated steel spring placed on top of a pole. The

steel spring is attached to a guide wire which allows the trap to slide down the pole to the ground.

- **Bow nets** are normally used for raptors but may also be used for European Starlings, shorebirds, and other species using visual bait and/or conspecific decoys. Bow nets are set on the ground and then remotely triggered from a nearby observation site. Once the net is triggered, the net envelopes the target birds inside the net similar to a suitcase when closed. APHIS-WS uses nontangling netting and makes positive identification of the target species prior to triggering this trap so there should be no possibility of capturing the protected species.

- **Decoy traps** are similar in design to the Australian Crow Trap as reported by McCracken (1972) and Johnson and Glahn (1994) or typical pigeon traps. Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds, which enter the trap through one-way doors and are unable to exit. Active decoy traps are monitored daily, every other day, or as appropriate if food, water, and shelter are provided, to remove and euthanize excess birds and to replenish bait and water. As with all larger equipment, decoy traps set for PDMTE will not be set where they can cause a visual disturbance to the protected species.

- **Drop nets** could be suspended over a pre-baited site and manually or remotely triggered to drop on target animals or manually dropped on target birds from a high site such as a bridge or rooftop. Decoys may also be used to enhance the effectiveness of drop nets. Drop nets require very specific knowledge of target species congregation locations and timing to be effective. For PDMTE small drop nets could be used to capture individual predators at known nest or roost sites if the proper conditions exist for deployment. Drop nets are hand triggered and would not be set in close proximity to T&E sites, so effects on T&E species should be minimal.

- **Cannon/Rocket nets** are normally used for larger birds, such as geese or pigeons and use mortar projectiles or compressed air to propel a net up and over birds that have been baited to a particular site. These traps are bulky and must be set up previous to the arrival of the target flock so target species must predictably use a small specific area (ie. waterfowl loafing sites) for this method to be effective. The habitat must be relatively flat, open and void of any tangling vegetation. The weight and mesh size of the net must be selected to effectively target specific species. For PDMTE, this method could be used to capture flocks of gulls baited to a specific area or waterfowl that present a disease or trampling hazard to T&E nest sites. This method creates noise and visual disturbance when applied but the requirement for open ground would prevent its deployment near most T&E nest/breeding sites. APHIS-WS will consult with site monitors/land managers on the location and timing if use of this method is warranted.

- **Nest box traps** are effective in capturing local breeding and post breeding European Starlings and other targeted secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976) and operate similar to other live-capture traps. Nest box traps allow birds to enter but not exit. The protected species of in the BA are not cavity nesters so this this technique will not present a hazard to them.

- **Nest/walk-in traps** are similar to box or decoy traps. They are placed over an active nest or baited with food and allow the target bird to pass through a funnel, one-way, or drop down door that confines the target. Nest and walk-in traps are effective in capturing ground nesting birds such as cormorants, ducks, geese, and ground feeding birds such as Rock Pigeons and Mourning Doves.

- **Mist nets** are more commonly used for capturing small-sized birds but can be used to capture larger birds, such as ducks and smaller raptors. It was introduced into the United States in the 1950s from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines the bird species that could be caught and overlapping pockets in the net cause birds to entangle themselves when they fly into the net. Decoys and electronic calls may also be used to enhance the effectiveness of mist nets. Mist nets set for PDMTE will only be set in known predator travel corridors where T&E species are not expected to fly. APHIS-WS use of mist nets will be discussed and carefully coordinated with site monitors/land managers.

- **Net guns/launchers** are normally used for flocking birds such as waterfowl and European Starlings. They use a firearm blank or compressed air to propel a weighted net up and over birds, which have been baited to a particular site or birds that do not avoid people. Net guns are manually discharged while net launchers are remotely discharged from a nearby observation site. These traps are made of nontangling material and deployed when the target is visually identified.

- **The Dho-gazza traps** employs the use of mist netting strung between poles with the objective being to guide the raptor in to the nets at a high speed flight. The mist nets are set to breakaway and thus wrap the raptor up. This method is most commonly used in northern harrier management and the setup centers around the raptor nest with a Great Horned Owl leashed to the nest area. Once the harrier sees the Great Horned Owl it typically makes a B-line to nest. This method will only be used where a known predator nests or roosts where the decoy bird would not create a visual disturbance for the protected species.

- **Bal-Chatri traps** consist of a small wire cage with monofilament nooses attached to the top, baited with a mouse or other live bait. Cages are generally constructed of ½" wire hardware cloth and may be from 2-3 inches tall, by 10-14 inches square. Larger Bal-chatri traps (using rabbits as bait) have been successfully used for capturing Red-tailed Hawks. For smaller species (i.e. shrikes and kestrels) nooses should be approximately 1½" in diameter and of good quality monofilament fishing line (8-12 lb. test). For larger species (e.g. red-tailed or red-shouldered hawks) the nooses should be made of 20-25 lb. test line, and from 2½"-3" in diameter. A 2-4 lb. weight must be attached to the trap using a strong line (such as parachute cord) of about 4-6 ft. in length. For PDMTE, Bal-Chatri traps are most commonly deployed under a known perch of an individual raptor and monitored from an unobtrusive location.

- **Swedish Goshawk traps** are compartment style traps with an upper claim shell style cage trap and a lower bait cage. The lower bait cage has stiff clear plastic affixed to the ceiling to give some protection from the elements and yet allows for visibility of the lure. The bait cage should hold at least two lures to increase movement and visibility of the trap. For PDMTE these traps are most commonly deployed under a known perch of an individual raptor.

- **Pigeon harnesses** are small back pack style leather trapping apparatus' secured to a live pigeon or European starling allowing the bait bird its full range of motion. Heavy weight mono-filament line tied into sliding nooses are attached to the backpack, with either a ground anchor or weight to secure everything to the ground. The pigeon harness method is deployed in view of a foraging raptor. This method is particularly good for Peregrine falcons. The nooses worn on the pigeon harness are used to entangle a target raptors feet when it captures the bait bird. This method is constantly monitored and only used near T&E sites where a foraging target raptor is already posing a threat.

Lethal Tools/Techniques come in a variety of styles to target avian species.

- **Shooting** is conducted with hand guns, rifles, and shotguns. APHIS-WS Directive 2.615 and the required National Rifle Association (NRA) training require APHIS-WS personal to only shoot at known targets where adequate backstop exists to stop the projectile. For PDMTE activities, shooting is frequently performed in conjunction with calling particularly for species such as common ravens and American crows. Calling/shooting is important for the management of wildlife that may have become wise to other management methods such as traps and deterrents. Shooting is a highly selective method which is typically used to remove a single problem individual. Shooting is limited to locations where it is safe to discharge firearms. Shooting to supplement harassment typically enhances the effectiveness of harassment techniques and can help prevent bird habituation to hazing methods (Kadlec 1968). Shooting is an essential management option but may be relatively expensive because of the on-site staff hours required.

  Firearms create short duration high intensity sound. When possible without reducing the effectiveness of the technique, APHIS-WS uses suppressors and specific ammunition to minimize the audio report of firearms. Suppressors and subsonic ammunition are most commonly used with rifles. Shotguns are commonly used for corvid and gull removal and cannot always be suppressed without affecting shot pattern and/or accuracy. APHIS-WS employees consider disruption caused by noise whenever selecting a method that causes audio reports such as firearms and pyrotechnics. When possible, APHIS-WS will maximize the buffer distance between T&E species and the use of audio methods, however in the case of predators actively foraging in the nest/breeding area, the audio disturbance created by a firearm may be preferable to the risk of predation from allowing the predator to continue foraging. In settings such as T&E sites on airports and military bases, the audio disturbance created by firearms used for PDMTE may be discountable when compared to the baseline audio levels on site. However, for more rural sites, audio disturbance will be discussed with site monitors and land managers to ensure that any audio disturbance is not substantial enough to cause nest abandonment or other effects in the protected species.

  Night shooting of nocturnal predators may be conducted with spotlights or night vision. Night vision use is imperceptible to the surrounding environment and so will not affect the protected species. Spotlights are high intensity lights that are used to identify and cause a temporarily pause in a target species movement. APHIS-WS will exercise caution when using spotlights near T&E nesting/breeding areas. Whenever possible, APHIS-WS will focus lights away from the protected species. APHIS-WS will access protected species response to spotlight use and discontinue or increase buffer distance if neccessary.

Shooting can be used in conjunction with calling devices to draw a predator within range. Calling devices can be manually blown or electronic. In all cases the noises emitted by the device are intended to mimic the sounds and volume of an animal in nature. Calls may replicate the sounds of prey species in distress (e.g. wounded rabbit) or the conspecific calls of the target species (e.g. mobbing crows). APHIS-WS uses care when selecting calling locations as to create a safe backstop for shooting and considers the approach direction of the animal so predators are not drawn through T&E use areas.

- **DRC-1339** is a slow acting avicide that is registered by APHIS-WS with the EPA for use on a number of species (e.g. ravens, crows, pigeons, gulls, blackbirds, and starlings), on various bait carriers, such as grain, meat baits, eggs, sandwich bread, and cull French fries. DRC-1339 is only available for use by APHIS-WS. For PDMTE, DRC-1339 would be used in accordance to label directions for corvids and gulls (see product labels, Appendix D). The EPA labels give specific instructions for bait preparation, prebaiting period, and application limits for the product. If nontarget species are observed near the prebait, the product will not be applied.

  DRC-1339 was developed as an avicide because of its differential toxicity to mammals and birds. DRC-1339 is highly toxic to sensitive species but only slightly toxic to non-sensitive birds, predatory birds, and mammals. Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors (Schafer, Jr. 1981), sparrows, and eagles are classified as non-sensitive. Acute oral toxicity data suggested some taxonomic groupings of birds were far less susceptible to CPTH than others (Eisemann et. al 2003). Secondary poisoning has not been observed with DRC-1339 treated baits. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to non-target and T&E species (EPA 1995). This can be attributed to relatively low toxicity to species that might scavenge on birds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

  DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. The half-life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. DRC-1339 is highly soluble in water, but does not hydrolyze, and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility.

- **Egg addling/oiling/destruction** are methods of suppressing reproduction in local predating bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times, which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them. Egg oiling is a method for suppressing reproduction of predating birds by spraying a small quantity of food grade corn oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability (Pochop 1998, Pochop et al. 1998). Oiling has an advantage over nest or egg destruction in that the incubating birds generally continue incubation and do not re-nest. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. Egg addling, oiling, and destruction are only done after positive identification of the nesting species, as such this method is extremely target specific and poses no threat to the species being protected.

Mammalian PDMTE Methods

The following methods are used to target mammalian predators in the course of PDMTE activites addressed in this BA. The intent of the utilized method(s) is to remove the damaging predatory species from the area to decrease adult mortality and increase population recruitment. APHIS-WS minimizes entry to the fullest extent possible to deliver reptilian PDMTE.

Dispersal and Deterrent Devices rely on the use of sound, lights, pursuit or other methods to disperse animals from the area to be protected. The success of frightening methods depends on animals' fear of, and subsequent aversion to offensive stimuli. Once animals become habituated to a stimulus, they often resume their damaging activities. Persistent effort is usually required to consistently apply frightening techniques and then vary them sufficiently to prolong their effectiveness. Over time, some animals learn to ignore commonly used scare tactics that are no longer perceived as threats. In many cases animals frightened from one location become a problem at another. The effects of frightening devices on non-target wildlife must also be considered. For example, sensitive birds may be disturbed or frightened from nesting sites. Types of dispersal and deterrent devices include:

- **Pyrotechnics, shell-crackers and scare cartridges**. See description above in Avian PDMTE Methods
- **Spot lights**. See description above in Avian PDMTE Methods

Live-Capture Traps/Tools come in a variety of styles to target mammalian species. All of the live capture traps have the ability to give APHIS-WS personal the opportunity to relocate depredating predator animals however the relocation of target animals involved in conflicts is prohibited according to State wildlife policy. California Department of Fish and Wildlife (CDFW) Manual No. 679 (Wildlife Rehabilitation and Care Standards) does not authorize nuisance wildlife relocation. CDFW, Fish and Game Commission Title 14 also states in section 671.6 (a) that "No person shall release into the wild without written permission of the commission any wild animal" (as defined by section 2116 of the Fish and Game Code). Except under limited circumstances, approved by the CDFW and USFWS (if migratory bird), APHIS-WS does not relocate wildlife.

- **Cage traps.** See description above in Avian PDMTE Methods
- **Net guns/launchers**. See description above in Avian PDMTE Methods

- **Padded-jaw foot-hold traps**. See description above in Avian PDMTE Methods
- **Neck snares** made of wire or cables are among the oldest wildlife management tools and are generally not affected by inclement weather. They can be used effectively to catch most species. Snares may be employed as either lethal or live-capture devices depending on how or where they are set. Snares set to capture an animal by the neck are usually lethal but stops can be applied to the cable to make the snare a live capture device. Snares positioned to capture the animal around the body can be useful live-capture devices. Snares can also be built with a breakaway feature to release non-target wildlife that are considerably larger than the target species. Snares can be effectively used wherever a target animal moves through a restricted lane of travel (i.e., "crawl holes" under fences, trails through vegetation, or den entrances). When an animal moves forward into the loop formed by the cable, the noose tightens and the animal is held. Snares used for PDMTE are made of adequately gauged wire that they pose no entanglement hazard to the T&E species being protected in this BA.
- **Foot snares** are a spring-powered non-lethal devices, activated when an animal places its foot on the trigger pan. In some situations using hanging snares to capture wildlife is impractical due to the behavior or morphology of the animal, or the location of many wildlife conflicts. Neck snares must be set in locations where the likelihood of capturing non-target animals is minimized, but foot snares with built-in pan tension devices can be set to exclude capturing animals lighter than the target animal. Foot snare devices are set in areas where predators are know to travel. All footsnares set for PDMTE will be adjusted for capture of mammals many times larger than the protected species, this prevents the triggering of the foot snare device by the protected species in the unlikely event that they would come in contact with the device.
- **Catch-poles** are a handheld device used to capture or safely handle problem animals. A catchpole is a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite of the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. For PDMTE, catch poles are primarily used to capture animals partially restrained by barriers (i.e., a dog "trapped" inside the colony fence) or to remove live animals from traps without danger to or from the captured animal.

Lethal Traps/Tools come in a variety of styles to target mammalian species. A number of specialized "quick-kill" traps are used in PDMTE work.

- **Rodent traps** are commercially available versions of snap traps commonly used to control household rat or mouse infestations. These traps are often used to collect and identify rodent species that cause damage so that species-specific management tools can be applied. If an infestation is minor, these traps may be used as the primary means of management. For T&E protection snap traps used for rat control are set in areas where terns, plovers, or rails would not typically come into contact with them. APHIS-WS does not use glue traps for rodent management on T&E protection projects. Rodent traps are not used in Salt marsh harvest mouse habitat.
- **Snares**, *See description above in live capture tools*

- **Shooting.** *See description in Avian PDMTE methods*

Reptilian PDMTE Methods

The following methods could be used to target reptilian predators as part of PDMTE activities addressed in this BA. The intent of the utilized method(s) is to remove the damaging predatory species from the area to decrease adult mortality and increase population recruitment. APHIS-WS minimizes entry to the fullest extent possible to deliver reptilian PDMTE.

Live-Capture Traps/Tools come in a variety of styles to target reptilian species.

All of the live capture traps have the ability to give APHIS-WS personal the opportunity to relocate depredating predator animals however the relocation of target animals involved in conflicts is prohibited according to State wildlife policy. California Department of Fish and Wildlife (CDFW) Manual No. 679 (Wildlife Rehabilitation and Care Standards) does not authorize nuisance wildlife relocation. CDFW, Fish and Game Commission Title 14 also states in section 671.6 (a) that "No person shall release into the wild without written permission of the commission any wild animal" (as defined by section 2116 of the Fish and Game Code). Except under limited circumstances, approved by the CDFW and USFWS (if migratory bird), APHIS-WS does not relocate wildlife.

- **Grid searches** are performed for the purpose of locating and removing gopher snakes and California king snakes in and around California least tern nesting areas with input and assistance from the site managers, biologist and monitors. Grid searches involves 1-3 personnel walking more or less in formation a few feet apart (vegetation dependent) through an affected area to search for snakes. There may be a need to search within the nesting colony or immediately adjacent to it. We coordinate with monitors ahead of time and read the on-site log books for current site/nesting information. They will advise as to areas to avoid, or times of day, temperature (i.e. too hot, too cold) etc. Monitors accompany APHIS-WS when there is a need to enter the nesting colony i.e. to investigate predation, follow tracks, search for snakes, etc. Once snakes were located they were captured by hand and euthanized.

- **Funnel traps** are a conical funnel and at least one access lid or door. The trap is placed on the ground along a naturally occurring linear object or drift fencing. The trap is designed to allow wildlife to enter the trap through the funnel and then confuse the animal once inside making it difficult for the animal to escape the trap. The traps are unselective but a live mouse can be used as bait to increase their attractiveness to reptilian predators. Funnel trapping can be an efficient sampling technique, although the literature is ambivalent about the relative performance of pitfall (e.g., Vogt and Hine, 1982; Enge, 2001) versus funnel traps (e.g., Greenberg et al., 1994; Jorgensen et al., 1998) (Ribeiro-Junior et al. 2008). For the purposes of PDMTE, when evidence of snakes is observed, funnel traps are placed on the borders of the T&E area to intercept foraging snakes prior to entering the nesting area.

- **Tube traps** are long cylindrical tubes of PVC or clear rigid plastic tubing capped at one end. National Wildlife Research Center (NWRC) ran trials with PVC traps as an inexpensive alternative to standard live traps on Argentine black and white tegu (Avery et al. 2016). "The importance of trap-encounter rate and the economy of PVC-type traps make them excellent for intensive trapping efforts" (Avery et al. 20106). Tube traps are usually used in concert with drift fencing. Tube traps are tipically not baited. For the purposes of PDMTE, when evidence of snakes is observed, tube traps are placed on the borders of the T&E area to intercept foraging snakes prior to entering the nesting area.

- **Drift fencing** act as vertical barriers that block the movement of animals across the landscape. There are multiple variations dependent on habitat and target species, however, APHIS-WS consist of 25-meter sections of 24-inch wide plastic mesh attached to wooden stakes driven into the ground. Drift fencing typically guides animals toward a pitfall bucket, funnel trap, or other capture device (Wilson et al. 2010). Drift fencing is effective at aiding in capturing snakes. For the purposes of PDMTE, drift fence could be used on the outside of a colony or nest area to intercept reptilian predators attempting to access the area.

Methods Summary

The most effective approach to resolving predator damage problems is to integrate the use of several of the above-referenced methods, either simultaneously or sequentially. The PDMTE activities evaluated in this BA integrate practical methods of prevention and reduces damage by wildlife while minimizing harmful effects of PDMTE activities on humans and the environment, including the T&E species being protected.

In selecting PDMTE techniques for specific damage situations, consideration is given to the damage causing species and the magnitude, geographic extent, duration and frequency, and likelihood of predation. Consideration is also given to the status of target and potential non-target species, local environmental conditions and affects, social and legal aspects, and relative costs of predation reduction options. The cost of predation reduction for PDMTE is a secondary concern because of the overriding environmental, legal, and animal welfare considerations.

Table 3. Methods and frequency of use by T&E species protected.

Method	California clapper rail	California least tern	Light-footed Ridgeway rail	Marbled murrelet	Western snowy plover	Salt marsh harvest mouse
Site Access	Daily	Daily	Daily	Weekly	Daily	Daily
Firearms	Daily	Daily	Daily	Weekly	Daily	Daily
Cage trap	Daily	Daily	Daily	Rare	Daily	Daily
Spotlight	Weekly	Weekly	Weekly	Rare	Weekly	Weekly
Padded foothold trap	Infrequent	Daily	Daily	Rare	Daily	Infrequent
Rodent traps	Not used	Daily	Weekly	Rare	Weekly	Not used
Bal-Chatri traps	Rare	Weekly	Rare	Rare	Weekly	Rare
DRC-1339	Rare	Weekly	Rare	Rare	Weekly	Rare
Pole traps	Rare	Weekly	Rare	Rare	Weekly	Rare
Pyrotechnics	Rare	Weekly	Rare	Not used	Weekly	Rare
Swedish Goshawk traps	Rare	Weekly	Rare	Rare	Weekly	Rare
Calling device	Infrequent	Infrequent	Rare	Infrequent	Weekly	Infrequent

Egg addling, oiling, & Nest destruction	Infrequent	Infrequent	Infrequent	Rare	Infrequent	Infrequent
Catch-pole	Rare	Infrequent	Rare	Rare	Rare	Rare
Effigies & Scarecrows	Rare	Infrequent	Rare	Rare	Rare	Rare
Foot/Leg snares	Rare	Rare	Rare	Not used	Rare	Rare
Funnel traps	Not used	Infrequent	Rare	Not used	Rare	Not used
Grid searches	Not used	Infrequent	Rare	Not used	Infrequent	Not used
Pigeon harness	Rare	Infrequent	Rare	Rare	Rare	Rare
Snares	Rare	Infrequent	Rare	Not used	Infrequent	Rare
Tube traps	Not used	Infrequent	Rare	Rare	Rare	Not used
Bow net trap	Rare	Rare	rare	Rare	Rare	Rare
Decoy traps	Rare	Rare	Rare	Rare	Rare	Rare
Dho-gazza traps	Rare	Rare	Rare	Rare	Rare	Rare
Lasers	Rare	Rare	Rare	Rare	Rare	Rare
Mist nets	Rare	Rare	Rare	Rare	Rare	Rare
Cannon/Rocket nets	Not used	Rare	Rare	Rare	Rare	Not used
Nest box traps	Not used	Rare	Rare	Rare	Rare	Not used
Nest/walk-in traps	Not used	Rare	Rare	Rare	Rare	Not used
Net guns/launchers	Not used	Rare	Rare	Rare	Rare	Not used
Barricades (inc tree sheathing)	Recommended Only	Recommended Only	Recommended Only	Recommended Only	Recommended Only	Recommended Only
Barrier fencing	Recommended Only	Recommended Only	Recommended Only	Recommended Only	Recommended Only	Recommended Only
Electric fencing	Recommended Only	Recommended Only	Recommended Only	Recommended Only	Recommended Only	Recommended Only
Surface coverings	Recommended Only	Recommended Only	Recommended Only	Not used	Recommended Only	Recommended Only

SPECIES PROTECTED

California Clapper Rail

Description. The California clapper rail is one of the largest rails, measuring 13-19 inches from bill to tail. It is characterized by its hen-like appearance, a long, slightly downward-curving bill, olive-brown upper parts, a cinnamon-buff colored breast, dark flanks crossed by white bars and white under tail coverts which are often exposed when the bird is agitated (USFWS 2016c).

The breeding season of California clapper rails begins by February. Nesting starts in mid-March and extends into August. Clapper rails use a network of small tidal sloughs for foraging and quick escape. They construct nests near them (within 10 meters), canopied with either pickleweed or cordgrass, sometimes gum-plant, salt grass, or drift materials. Density of cover, floatability of materials, height above tides, and annual climate changes are all variables of successful nesting. California clapper rails also construct "brood nests" on higher ground to protect their young from storm tides. These are usually simple floatable, platforms of twigs or stems, without a canopy.

Species Status and Distribution. The California clapper rail is a perennial inhabitant of tidal salt marshes of the greater San Francisco Bay. Throughout their distribution, California clapper rails occur within a range of salt and brackish marshes. In south and central San Francisco Bay and along the perimeter of San Pablo Bay, rails typically inhabit salt marshes dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*) (USFWS 2002a).

The California clapper rail was designated as Endangered under the Endangered Species Act in October 1970 (Federal Register Vol. 35, No. 199; 16047, October 13, 1970). The rail is threatened by destruction and degradation of its habitat. Over harvesting initially contributed to the decline of California clapper rail populations until protection was afforded by the Migratory Bird Treaty Act in 1913. The loss of tidal marsh habitat to development has been a long term impact (USFWS 1984). The clapper rail population is "besieged" by mammal and bird predators including nonnative Norway rats, nonnative red foxes, and raptors (USFWS 2002a). The proliferation of nonnative red foxes into tidal marshes of the South Bay since 1986 has had a serious effect on clapper rail populations (USFWS 2010a).

A Recovery Plan for the salt marsh harvest mouse and California clapper rail was prepared in 1984 (USFWS 1984). The USFWS is preparing another recovery plan for this species and other species found in the San Francisco Bay. Based on winter counts from 1996-97, the USFWS and CDFW estimated that the south bay population is 500-600 birds with a similar size for the North Bay. Predation accounted for a loss of 38 percent of the eggs, flooding for 1.4 percent, abandonment for 3.3 percent, 16 percent of the eggs were nonviable, and the fate of 1.3 percent of the eggs was unknown (USFWS 2013). Winter airboat surveys in 1992-1993 documented a California clapper rail population increase in many South Bay marshes in apparent response to predator control that began in 1991 (Harding et al. 1998; USFWS 2013). PRBO Conservation Science conducted estuary-wide surveys of the Bay Area for California clapper rail between 2005 and 2008. Results of this survey estimate a minimum average population between 2005 and 2008 of 1,425 rails (Liu et al. 2009), however, densities declined during that period at a per-year rate of 20 percent (USFWS 2013).

Designated Federal Critical Habitat. No critical habitat rules have been published for the California clapper rail.

Methods Used and Species Specific Effects

Table 4. Predator control methods and potential effects on California clapper rail with rationale.

Predator Control Method	Potential Impact on California clapper rail
Human access & presence on site	LAA
Pyrotechnics	LAA
Shooting (ground)	LAA
Euthanasia & disposal of captured predators	NLAA-BE
Egg addling/destruction	NLAA-BE
Egg oiling	NLAA-BE

Bal-Chatri traps	NLAA-BE
Bow nets	NLAA-BE
Cage traps	NLAA-BE
Cannon/rocket nets	NLAA-BE
Catch poles	NLAA-BE
Decoy traps	NLAA-BE
Dho-gazza traps	NLAA-BE
Drop nets	NLAA-BE
Foot/leg snares	NLAA-BE
Lasers	NLAA-BE
Mist nets	NLAA-BE
Neck/body snares	NLAA-BE
Nest box traps	NLAA-BE
Nest/walk-in traps	NLAA-BE
Net guns/launchers	NLAA-BE
Padded-jaw foot hold traps	NLAA-BE
Pidgeon harnesses	NLAA-BE
Pole traps	NLAA-BE
Scarecrows & Effigies	NLAA-BE
Spotlights	NLAA-BE
Swedish goshawk traps	NLAA-BE
Neck/body snares	NE- equipment design
Rodent Traps- snap type	NE- equipment design & deployment location
DRC-1339	NE- equipment design & use per EPA label
Drift fencing	NE- no use in range of species
Funnel Traps	NE- no use in range of species
Grid Searches	NE- no use in range of species
Tube Traps	NE- no use in range of species
Barricades	NE- APHIS-WS not lead agency
Barrier fencing	NE- APHIS-WS not lead agency
Electric fencing	NE- APHIS-WS not lead agency
Surface coverings	NE- APHIS-WS not lead agency

Table 4 summarizes the potential effects of PDMTE activities/methods on California clapper rail. All activities involve APHIS-WS accessing the site to place or monitor equipment. To more clearly evaluate the potential effects of the individual methods on the species, site access/presence was considered as its own activity. As such, twenty four methods (*see Table 4*) were found to be overall beneficial and not likely to adversely affect California clapper rail. Neck/body snares and snap traps were determined to have no effect on California clapper rail due to equipment design and/or deployment location. DRC-1339 was determined to have no effect on California clapper rail due to design and use per EPA label instructions. Four reptile capture methods were determined to have no effect due to not being used in the range of this species. Barricades, barrier fencing, electric netting, and surface coverings were not further evaluated as APHIS-WS is not the lead agency and does not implement these actions in the field. Human access/presence, pyrotechnic, and firearm use have the most potential to affect California clapper rails and are discussed further below.

Human access/presence on site could cause a temporary disturbance of California clapper rail. Short term temporary disturbance includes a bird standing up while incubating eggs on a nest to flushing off the nest, circling and returning. Proximity to nest site, timing within the nesting cycle, duration and frequency of visits are all important factors as to whether an individual is disturbed to the level of harassment. If the disturbance is prolonged it could cause the abandonment of a specific nesting attempt. Birds are more likely to abandon nests early in the nesting cycle, before they have invested much energy in a particular nest. They are also much more likely to be harassed the longer the duration or more frequent the disturbance. The likelihood of predation may also increase if an incubation bird is off the nest too long. Despite these possibilities California clapper rail live a rather concealed life and tend to be fairly tolerant of disturbance. "Clapper rails are not as prone to reacting to the presence of humans in the vicinity of their habitat as are other bird species; however, foraging opportunities may be disrupted if humans are present for long periods in clapper rail territories" (USFWS 2006a). Use of vehicles or watercraft to approach T&E protection sites could cause disturbance similar to that of human presence. Since APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment there is the potential to step on, knock down or otherwise accidently crush an unknown nest. California clapper rails have been known to posture and defend a nest (USFWS 2012a) which reduces the likelihood of this direct effect. Close coordination with the site managers, biologist and monitors will be necessary to minimize any effects to the California clapper rails, nests or broods.

The noise from **Shooting** and **Pyrotechnics** used to lethally remove or haze foraging predators from T&E sites, may cause temporary disturbance to California clapper rails. There is not a considerable amount of research on peak audio thresholds for disturbance of this species. Loud noises for sites on or near airports and military bases may be discountable when compared to the background noise already present on the site, but for sites that are more secluded there is the potential that even infrequent, loud noises could cause a bird to move, stand up while incubating eggs, or even flush off a nest.

Species Specific Minimization Measures

To minimize the potential for negative impacts to California clapper rail when working to protect California clapper rails in California clapper rail habitat:

1. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding rails.

2. If boats are required for marsh access, the speed of the boat will be reduced when approaching the marsh. (Special Terms and Conditions for PRBO Permit 2001).

3. Disturbance to rails will be minimized to the maximum extent possible during the breeding season. (Special Terms and Conditions for PRBO Permit 2001).

4. All due precautions will be taken to limit harm to clapper rails by establishing survey routes

that incorporate existing roads, levees, and boardwalks whenever possible and by knowledge of where clapper rails nest and what clapper rail nest look like. (Special Terms and Conditions for PRBO Permit 2001).

5. All personnel will keep talking and other noise to a minimum near the marsh to reduce disturbance (USFWS 2016f).

6. If California clapper rail nests are encountered, the observers will immediately leave the vicinity of the nest, careful not to disturb the nest in any way. If adult California clapper rail or chicks are encountered, observers will carefully move away from the birds if they are giving alarm calls or otherwise appear agitated (USFWS 2016f).

7. Hazing with pyrotechnics will be used only beyond 250 feet from a known California clapper rail nest.

California Least Tern

Description. The California least tern is a small migratory bird. It has long, narrow wings and a broad, forked tail. It also has a black-capped head and black-tipped, pale gray wings contrasting with its white body. It bears a white blaze across its forehead, dark forewings, black-tipped yellow bill, and yellowish feet and is less the 25 cm when full grown and has 75 cm wingspan (USFWS 2016a).

The California least tern winters in Latin America. It nests along the Pacific coast from southern Baja California to San Francisco Bay. Least terns are usually found in California between April and August. They nest in colonies on isolated or specially protected sand beaches or open areas in remnant coast wetlands near estuaries, bays, or harbors where small fish are abundant (CDFG 2003a).

Species Status and Distribution. The California least tern was designated as Endangered under the Endangered Species Act in June 1970 (Federal Register Vol. 35, No. 199; 16047, October 13, 1970). The breeding population between 1973 and 1976 was approximately 600 pairs (USFWS 2006b). The use of fencing and lethal /nonlethal predator control measures has reduced levels of predations (USFWS 2006b). Although the annual rate of population change has been variable and sometimes negative the net result has been a population increase (USFWS 2006b). An estimated 4232-5786 California least tern breeding pairs established 6038 nests and produced 2136-2859 fledglings at 48 documented locations across California (Frost 2015). The California least tern has been, and is, concentrated in three southern California counties: Los Angeles, Orange, and San Diego (USFWS 2006b). California least tern breeding site usage and reproductive success is limited by human activity, wildlife and environmental sources of mortality and disturbance. The predators known to be responsible for the greatest number of depredated least terns in 2014 were common ravens (Corvus corax), followed by American crows (Corvus brachyrhynchos), peregrine falcons (Falco peregrinus), coyotes (Canis latrans), gull species, western meadowlarks (Sturnella neglecta), unknown species, corvid species, raptor species, great horned owls (Bubo virginianus), northern harriers (Circus cyaneus), opossums (Didelphis virginiana), unknown avian species, and American kestrels (Falco sparverius) (Frost 2015). At some sites, the presence of large populations of predators precludes nesting (CDFG 2003a). Even with lethal and non-lethal predation prevention management used at most sites in 2005, predation led to the mortality of 833 eggs, 104-107 chicks, 36 fledglings, and 35 adults (USFWS 2006b).

Designated Federal Critical Habitat. No critical habitat rules have been published for the California Least tern.

Methods Used and Species Specific Effects

Table 5. Predator control methods used and potential effect on California least terns with rationale.

Predator Control Method	Potential Impact on California least tern
Grid Searches	LAA
Human Presence & Access	LAA
Pyrotechnics	LAA
Rodent snap traps	LAA
Shooting	LAA
Euthanasia & disposal of captured predators	NLAA, BE
Drift fencing	NLAA, BE
Egg addling/destruction	NLAA, BE
Egg oiling	NLAA, BE
Funnel Traps	NLAA, BE
Tube Traps	NLAA, BE
Bal-Chatri traps	NLAA-BE
Bow nets	NLAA-BE
Cage traps	NLAA-BE
Cannon/rocket nets	NLAA-BE
Catch poles	NLAA-BE
Decoy traps	NLAA-BE
Dho-gazza traps	NLAA-BE
Drop nets	NLAA-BE
Foot/leg snares	NLAA-BE
Lasers	NLAA-BE
Mist nets	NLAA-BE
Neck/body snares	NLAA-BE
Nest box traps	NLAA-BE
Nest/walk-in traps	NLAA-BE
Net guns/launchers	NLAA-BE
Padded-jaw foot hold traps	NLAA-BE

Pidgeon harnesses	NLAA-BE
Pole traps	NLAA-BE
Scarecrows & Effigies	NLAA-BE
Spotlights	NLAA-BE
Swedish goshawk traps	NLAA-BE
Neck/body snares	NE- equipment design
DRC-1339	NE equipment design & use per EPA label
Barricades	NE- APHIS-WS not the lead agency
Barrier fencing	NE- APHIS-WS not the lead agency
Electric fencing	NE- APHIS-WS not the lead agency
Surface coverings	NE- APHIS-WS not the lead agency

Table 5 summarizes the potential effects of PDMTE activities/methods on California least terns. All activities involve APHIS-WS accessing the site to place or monitor equipment. To more clearly evaluate the potential effects of the individual methods on the species, site access/presence was considered as its own activity. As such, twenty six methods (*see Table 5*) were found to be overall beneficial and not likely to adversely affect California least terns. Neck/body snares were determined to have no effect on California least tern due to equipment design. DRC-1339 was determined to have no effect on California clapper rail due to design and use per EPA label instructions. Barricades, barrier fencing, electric netting, and surface coverings were not further evaluated as APHIS-WS is not the lead agency and does not implement these actions in the field. Human access/presence, pyrotechnics, firearms, grid searches, pole traps and rodent snap traps have the most potential to affect California least terns and are discussed further below.

Human access/presence on site could cause a temporary disturbance of California least terns. Short term temporary disturbance includes a bird standing up while incubating eggs on a nest to flushing off the nest, circling and returning. Proximity to nest site, timing within the nesting cycle, duration and frequency of visits are all important factors as to whether an individual is disturbed to the level of harassment. If the disturbance is prolonged it could cause the abandonment of a specific nesting attempt. Birds are more likely to abandon nests early in the nesting cycle, before they have invested much energy in a particular nest. They are also much more likely to be harassed the longer the duration or more frequent the disturbance. The likelihood of predation may also increase if an incubation bird is off the nest too long. Despite these possibilities the goal of the program is for the benefit of the species. "Temporary disturbance to nesting least terns could occur during monitoring; however, the benefits of the data provided as a result of monitoring outweigh the minor temporary adverse effects that occur during monitoring" (Patton 2002; USFWS 2006a). Implementing PDMTE by the same logic would provide a greater net benefit to least terns than the "minor adverse effects" of "temporary disturbance". Use of vehicles or watercraft to access T&E protection sites could cause disturbance similar to that of human presence. Since APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment there is the potential to step on or otherwise accidently crush a nest. Close coordination with the site manager, biologists and monitors will be necessary to minimize any effects to California least terns.

The noise from **Shooting** and **Pyrotechnics** used to lethally remove or haze foraging predators from T&E sites, may cause temporary disturbance to California least terns. There is not a considerable amount of research on peak audio thresholds for disturbance of this species. Loud noises for sites on or near airports and military bases may be discountable when compared to the background noise already present on the site, but for sites that are more secluded there is the potential that even infrequent, loud noises could cause a bird to move, stand up while incubating eggs, or even flush off a nest.

Grid searches for snakes have similar but potentially increased risk to cause direct effects on California least terns as site access and human presence. If APHIS-WS personnel will be operating in and around nesting areas conducting the search, there is the potential to step on or otherwise accidently crush a nest. Close coordination with the site manager, biologists and monitors will be necessary to minimize any effects to California least terns.

Pole traps were first used in tern colonies during the 1989 breeding season when there had been severe predation by kestrels and shrikes. The APHIS-WS program is aware of four instances of taking California least terns with pole traps in the course of implementing PDMTE between 1989 and 2006. These takings occurred at Camp Pendleton in 1989, FAA Island in 1993, Batiquitos Lagoon in 1996, and Naval Amphibious Base in 2006. After each take event, APHIS-WS notified USFWS of the incidental take and requested guidance. APHIS-WS was instructed "It is apparent that the benefits to the colony of capturing individual raptors that could cause impact or abandonment of the colony outweighs the risk of capturing CLT in the trap, especially given the low frequency of least tern capture over the past 17 years" (USFWS 2006c). In subsequent years, APHIS-WS refined the traps to be more humane, effective and selective. The pan tension on these traps can be adjusted so that the trap is triggered by the weight of a larger raptor but not by the weight of a least tern. The incidental captures occurred when traps were adjusted to capture smaller predators (kestrels and Gull-billed terns) that were actively predating on the colonies. Pole traps are not normally placed in dense colonies such as the Mariner's Point site and the FAA Island site, both in Mission Bay, to minimize take. Although rare, there may also be situations where traps will only be set at night for owls, and removed during the day so as to further reduce the potential to capture a tern. While APHIS-WS has not captured a California least tern with this tool since the last adjustments were made in 2006, the potential for capture, however rare, still exists.

APHIS-WS captured two least tern fledglings in **Rodent snap traps** at Mariner's Point, San Diego County in 1998 and 2003. The fledglings were captured away from the nest area in an adjacent rock rip-rap area where snap traps were set to control invasive rats that were predating on the colony. Snap traps used in the adjacent rip-rap areas are now modified by attaching the trap to wooden stakes and housing them well within the rip-rap, making them less accessible to birds. Snap traps may also be housed in elevated stations in other areas or are placed well away from colonies. When the take incidents occurred APHIS-WS notified the USFWS and it was determined that tern chicks/fledglings that find their way over the chick barrier and into the rip-rap area, are likely to fall into rock crevices, into the bay, or to be eaten by crabs and that predator control work was still necessary in the area. Despite best efforts to minimize risk to California least terns, the potential for capture still exists when PDMTE for rodents predating on T&E sites.

Species Specific Minimization Measure

To minimize the potential for negative impacts to California least tern when working to protect California least tern in California least tern habitat:

1. APHIS-WS abides by restrictions in place to minimize disturbance to nesting terns. For example, if the substrate is extremely hot, or conversely, if ambient temperature is below 65°F, care is taken to insure that nesting birds do not leave for more than 15 minutes. (1995 California Least Tern Monitoring Protocols from Carolee Caffrey). APHIS-WS generally avoids entry into the colonies unless there is a need to inspect for predation or predator sign, or to remove a particular predator from inside the colony. As often as possible, APHIS-WS attempts to coordinate with the site monitors and enter the colony with them, so as to minimize disturbance. APHIS-WS completes its activities as quickly as possible to reduce disturbance.

2. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding terns.

3. When entering a nesting colony, activities shall be conducted as unobtrusively as possible and with the least amount of disturbance to the colony. (Special Terms and Conditions for Point Reyes Bird Observatory (PRBO) Permit 2001). Visits to trap sites near nests will be limited to minimize potential harassment and to minimize attracting other predators. Visits to control sites will be done in cooperation with biologists monitoring the protected nests to best avoid disturbing incubating adult shorebirds.

4. Hazing with pyrotechnics will be used only beyond 250 feet from a known California least tern nest.

5. Pan tension devises shall be adjusted so that the trap is triggered by the weight of a raptor but not by the weight of a California least tern.

Light-footed Clapper Rail

Description. The light-footed clapper rail is a coot-sized marsh bird. It is long-legged, long-toed, and approximately 14 inches long. It has a slightly down-curved beak and a short, upturned tail. Males and females are identical in plumage. Their cinnamon breast contrasts with the streaked plumage of its grayish brown back and gray and white barred flanks (USFWS 2016b).

The light-footed clapper rail uses southern California coastal salt marshes, lagoons, and their maritime environs. The birds nest in the lower littoral zone of coastal salt marshes where dense stands of cordgrass are present. They also occasionally build nests in pickleweed. Light- footed clapper rails have also been known to reside and nest in freshwater marshes, although this is not common. They require shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water (Massey et al. 1984; USFWS 2008).

Species Status and Distribution. Historically, the light-footed clapper rail breed in marsh vegetation of coastal wetlands from Santa Barbara County to San Diego County and northern Baja California. Predation by cats, foxes, and other predators is a likely cause for extirpation in Carpinteria Marsh in Santa Barbara County (UFWS 2009a). The range in California now extends from Ventura County in the north to the Mexican border in the south (USFWS 2009a). Light-footed clapper rails inhabit cordgrass-pickleweed salt marsh year-round, feeding on crabs, snails and other invertebrates (CDFG 2003b).

The light-footed clapper rail was designated as Endangered under the Endangered Species Act in October 1970 (Federal Register Vol. 35, No. 199; 16047, October 13, 1970). CDFG (2003b) reports decreases in many of the marshes, with the most important declines at Seal Beach National Wildlife Refuge and Upper Newport Bay Ecological Reserve. In 1998 El Niño weather and tidal conditions may have caused nesting failures and reduced food availability. Tijuana River Marsh National Wildlife Refuge, which essentially lost its rail population in the mid-1980s, has rebounded, and in 1999 reached its highest population, 80 pairs. These three subpopulations accounted for 85% of the total number of breeding pairs in California each year from 1997 through 1999. The total population of the subspecies, both in its entire range and in its range in California, represents one of the smallest known populations of any bird subspecies on the west coast of North America. A statewide abundance estimate was not available at listing, however, the number of light-footed clapper rails increased from 203 pairs in 1980 to 443 pairs in 2007 (USFWS 2009a). A 1997 survey of light-footed clapper rails estimated 307 breeding pairs, the second highest reported since 1980 (Zembal et al. 1998). A total of 656 pairs exhibited breeding behavior in 18 marshes in 2016 (Zembal et al. 2016).

Designated Federal Critical Habitat. No critical habitat rules have been published for the light-footed clapper rail.

Methods used & Species Specific Effects

Table 6. Methods used and potential for effect on Light-footed clapper rail with rationale.

Predator Control Method	Potential Impact on Light-footed clapper rail
Human presence & site access	LAA
Pyrotechnics	LAA
Shooting (ground)	LAA
Euthanasia & disposal of captured predators	NLAA-BE
Egg addling/destruction	NLAA-BE
Egg oiling	NLAA-BE
Bal-Chatri traps	NLAA-BE
Bow nets	NLAA-BE
Cage traps	NLAA-BE
Cannon/rocket nets	NLAA-BE
Catch poles	NLAA-BE
Decoy traps	NLAA-BE
Dho-gazza traps	NLAA-BE
Drop nets	NLAA-BE
Foot/leg snares	NLAA-BE
Lasers	NLAA-BE

Mist nets	NLAA-BE
Neck/body snares	NLAA-BE
Nest box traps	NLAA-BE
Nest/walk-in traps	NLAA-BE
Net guns/launchers	NLAA-BE
Padded-jaw foot hold traps	NLAA-BE
Pidgeon harnesses	NLAA-BE
Pole traps	NLAA-BE
Scarecrows & Effigies	NLAA-BE
Spotlights	NLAA-BE
Swedish goshawk traps	NLAA-BE
Neck/body snares	NE- equipment design
Rodent snap traps	NE- equipment design & deployment location
DRC-1339	NE- equipment design & use per EPA label
Drift fencing	NE- not used in range of species.
Funnel Traps	NE- not used in range of species.
Grid Searches	NE- not used in range of species.
Tube Traps	NE- not used in range of species.
Barricades	NE- APHIS-WS is not the lead agency.
Barrier fencing	NE- APHIS-WS is not the lead agency.
Electric fencing	NE- APHIS-WS is not the lead agency.
Surface coverings	NE- APHIS-WS is not the lead agency.

Table 6 summarizes the potential effects of PDMTE activities/methods on Light-footed clapper rail. All activities involve APHIS-WS accessing the site to place or monitor equipment. To more clearly evaluate the potential effects of the individual methods on the species, site access/presence was considered as its own activity. As such, twenty four methods (*see Table 6*) are expected to be overall beneficial and not likely to adversely affect Light-footed clapper rail. Neck/body snares and snap traps were determined to have no effect on Light-footed clapper rail due to equipment design and/or deployment location. DRC-1339 was determined to have no effect on Light-footed clapper rail due to design and use per EPA label instructions. The four reptile capture methods were determined to have no effect due to not being used in the range of this species. Barricades, barrier fencing, electric netting, and surface coverings were not further evaluated, as APHIS-WS is not the lead agency and does not implement these actions in the field. Human access/presence, pyrotechnic, and firearm use have the most potential to affect Light-footed clapper rails and are discussed further below.

Human access/presence on site could cause a temporary disturbance of Light-footed clapper rail. Short term temporary disturbance includes a bird standing up while incubating eggs on a nest to flushing off the nest, circling and returning. Proximity to nest site, timing within the nesting cycle, duration and frequency of visits are all important factors as to whether an individual is disturbed to the level of harassment. If the disturbance is prolonged it could cause the abandonment of a specific nesting attempt. Birds are more likely to abandon nests early in the nesting cycle, before they have invested much energy in a particular nest. They are also much more likely to be harassed the longer the duration or more frequent the disturbance. The likelihood of predation may also increase if an incubation bird is off the nest too long. Despite these possibilities clapper rail live a rather concealed life and tend to be fairly tolerant of disturbance. “Clapper rails are not as prone to reacting to the presence of humans in the vicinity of their habitat as are other bird species; however, foraging opportunities may be disrupted if humans are present for long periods in clapper rail territories” (USFWS 2006a). Use of vehicles or watercraft to approach T&E protection sites could cause disturbance similar to that of human presence. Since APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment there is the potential to step on, knock down or otherwise accidently crush an unknown nest. Close coordination with the site managers, biologist and monitors will be necessary to minimize any effects to the Light-footed clapper rails, nests or broods.

The noise from **Shooting** and **Pyrotechnics** used to lethally remove or haze foraging predators from T&E sites, may cause temporary disturbance to Light-footed clapper rails. There is not a considerable amount of research on peak audio thresholds for disturbance of this species. Loud noises for sites on or near airports and military bases may be discountable when compared to the background noise already present on the site, but for sites that are more secluded there is the potential that even infrequent, loud noises could cause a bird to flush, stand up while incubating eggs, or even flush off a nest.

Species Specific Minimization Measures

To minimize the potential for negative impacts to light-footed clapper rail when working to protect light-footed clapper rails in light-footed clapper rail habitat:

1. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding rails.

2. If boats are required for marsh access, the speed of the boat will be reduced when approaching the marsh. (Special Terms and Conditions for PRBO Permit 2001).

3. Disturbance to rails will be minimized to the maximum extent possible during the breeding season. (Special Terms and Conditions for PRBO Permit 2001).

4. All due precautions will be taken to limit harm to clapper rails by establishing survey routes that incorporate existing roads, levees, and boardwalks whenever possible and by knowledge of where clapper rails nest and what clapper rail nest look like. (Special Terms and Conditions for PRBO Permit 2001).

5. Hazing with pyrotechnics will be used only beyond 250 feet from a known light-footed clapper rail nest.

Marbled Murrelet

Description. The marbled murrelet is a small diving seabird. Marbled murrelets require dense, mature forests of redwood and Douglas fir for breeding and nesting. The marbled murrelet is a small, chubby seabird that has a very short neck. During the breeding season it has dark brown to blackish upperparts and a white belly and throat that are greatly mottled. During the winter the upperparts become grey, dark marks form on the sides of the breast and a white ring develops around the eye. Males and females are similar in appearance and size. Juveniles are similar to the adult winter plumage, but with dusky mottling on the underparts. Vocalizations include a sharp keer' or low kee' (USFWS 2016e).

Marbled murrelets nest in the canopy of old growth forests. They produce one egg per nest and usually only nest once a year, however re-nesting is documented. Nests are not built, but rather the egg is placed in a small depression or cup made in moss or other debris on the limb. Both sexes incubate the egg in alternating 24-hour shifts. The chick is fed up to eight times daily, and is usually fed only one fish at a time. The young are semiprecocial, capable of walking but not leaving the nest. Fledglings fly directly from the nest to the ocean.

Species Status and Distribution. The marbled murrelet breeds along the Pacific coast of North America from the Aleutian Archipelago and southern Alaska south to central California. In the Pacific Northwest (including California) it forages almost exclusively in the nearshore marine environment (mainly within a few kilometers offshore), but flies inland to nest in mature conifers. California, Oregon and Washington populations were listed as federally threatened species on 9/30/92. The Recovery Plan for the Marbled Murrelet (USDI 1997) lists substantial loss and modification of nesting habitat (older forest) and mortality from net fisheries and oil spills as major contributors to its decline. Other factors include high predation rates at nest sites (USDI 1997; USDA 2006). The marbled murrelet is listed as endangered by California. Marbled murrelets use primarily typical old-growth forests (characterized by large trees, a multistoried stand, and moderate to high canopy closure), but also use mature forests with an old-growth component. Trees must have large branches or deformities for nest platforms, with the occurrence of suitable platforms being more important than tree size alone. Specific nesting habitat requirements and life-history strategy, a low reproductive rate, a low current breeding success and recruitment rate (based on juvenile:adult ratios) are likely to yield a decreasing population. Only about 700 birds occur between Humboldt and San Mateo Counties in California. Nests are difficult to locate (USDA 2006) but surveys of adult activity are used to monitor the potential effectiveness of nest predation management (E, Covington, pers. Comm.). Using distance sampling estimation techniques (same method as Conservation Zones 1-5), they estimated the 2007 Conservation Zone 6 population to be 367 birds (95% CL: 240-562) and the 2008 Conservation Zone 6 population to be 174 birds (95% CL: 91-256) (USFWS 2009b). Predation management is necessary since populations in California are low and removing and/or minimizing threats to survivorship is a one of the recovery objectives (USDI 1997). Current research suggests that a combination of low food availability in some years and predation in others restricts successful reproduction in central California (Peery et al. 2004, USFW 2009b). Peery et al. (2004, pp.1093-1094) documented predators as the cause of nest failure for 67 percent of known fate nests (n=9) in the Santa Cruz Mountains of California (USFWS 2009b). In the analysis for the 2004 5-year review, predation was identified as being a significant threat to long term demography (USFWS 2009b).

Designated Federal Critical Habitat for the marbled murrelet in California encompasses 31 subunits (USFWS 2015). APHIS-WS does not modify habitat and PDMTE will not cause changes in T&E species use of designated Critical Habitat.

Methods used and Species Specific Effects

Table 7. Predator control methods used and potential for impact on Marbled murrelets with rationale.

Predator Control Method	Potential Impact on Marbled Murrelet
Human presence & site access	LAA
Shooting	LAA
Lasers	NLAA-BE
Scarecrows & Effigies	NLAA-BE
Spotlights	NLAA-BE
Rodent snap traps	NE- equipment design & deployment location
DRC-1339	NE- equipment design, location & use per EPA label
Bal-Chatri traps	NE- deployment location
Bow nets	NE- deployment location
Cage traps	NE- deployment location
Cannon/rocket nets	NE- deployment location
Catch poles	NE- deployment location
Decoy traps	NE- deployment location
Dho-gazza traps	NE- deployment location
Drift fencing	NE- deployment location
Drop nets	NE- deployment location
Egg addling/destruction	NE- deployment location
Egg oiling	NE- deployment location
Euthanasia & disposal of captured predators	NE- deployment location
Foot/leg snares	NE- deployment location
Funnel Traps	NE- deployment location
Grid Searches	NE- deployment location
Mist nets	NE- deployment location
Neck/body snares	NE- deployment location
Nest box traps	NE- deployment location
Nest/walk-in traps	NE- deployment location
Net guns/launchers	NE- deployment location
Padded-jaw foot hold traps	NE- deployment location
Pidgeon harnesses	NE- deployment location
Pole traps	NE- deployment location
Pyrotechnics	NE- deployment location
Swedish goshawk traps	NE- deployment location
Tube Traps	NE- deployment location
Neck/body snares	NE- deployment location

Barricades	NE- APHIS-WS is not the lead agency
Barrier fencing	NE- APHIS-WS is not the lead agency
Electric fencing	NE- APHIS-WS is not the lead agency
Surface coverings	NE- APHIS-WS is not the lead agency

Table 7 summarizes the potential effects of PDMTE activities/methods on Marbled murrlet. All activities involve APHIS-WS accessing the site to place or monitor equipment. To more clearly evaluate the potential effects of the individual methods on the species, site access/presence was considered as its own activity. As such, lasers, scarecrows & effigies, spotlights methods are expected to be overall beneficial and not likely to adversely affect Marbled murrelets. Twenty seven methods (*see Table 7*) were determined to have no effect on Marbled murrelet due to their deployment location prohibiting contact with the species. Rodent snap traps were determined to have no effect on Marbled murrlets due to design and deployment location. DRC-1339 was determined to have no effect on Marbled murrelet due to design, deployment locations, and use per EPA label instructions. Barricades, barrier fencing, electric netting, and surface coverings were not further evaluated, as APHIS-WS is not the lead agency and does not implement these actions in the field. Human access/presence, pyrotechnic, and firearm use have the most potential to affect Light-footed clapper rails and are discussed further below.

Human access/presence on site could cause a temporary disturbance of Marbled murrelets. Disturbance should be minimal as all APHIS-WS actions will occur from the ground with canopy height and subcanopy vegetation layers blocking sightlines and buffering noise from below. Short term temporary disturbance includes a bird standing up while incubating eggs on a nest to flushing off the nest, circling and returning. Proximity to nest site, timing within the nesting cycle, duration and frequency of visits are all important factors as to whether an individual is disturbed to the level of harassment. If the disturbance is prolonged it could cause the abandonment of a specific nesting attempt. Birds are more likely to abandon nests early in the nesting cycle, before they have invested much energy in a particular nest. They are also much more likely to be harassed the longer the duration or more frequent the disturbance. The likelihood of predation may also increase if an incubation bird is off the nest too long. Site access via vehicles should not be a factor as several studies have found vehicular traffic noise appeared to have little or no effect on murrelet nesting success (Hebert and Golightly 2006; Golightly et al. 2009, USFWS 2009b). "The conclusion in McShane et al. (2004, p.6-10) regarding scientific research was that while individual murrelets are affected by telemetry and tree-climbing projects, these disturbances are relatively small scale, occur infrequently, and are unlikely to affect murrelet populations" (USFWS 2009b). Other studies referenced by USFWS (2003) included little or no responses from incubating adults and chicks due to road-grading, logging operations within 800 meters, and loud radios as well as vehicles passing within 70 m of the nest on both lightly and heavily used roads (Long and Ralph 1998). As all APHIS-WS PDMTE activities for Marbled murrelet will occur from the ground, there should be not step hazard for this species.

The noise from **Shooting** used to lethally remove or haze foraging predators from T&E sites, may cause temporary disturbance to Marbled murrelets. There is research on audio disturbance of this species. Long and Ralph (1998) reported no reaction from a Marbled murrlets (not distinguished as adult or chick) when many rifle shots (unsuppressed rifle volume 120-170 dB) were fired within 200 m from the nest. Other studies reported little or no responses from incubating adults and chicks due to road-grading, logging operations within 800 meters, and loud radios as well as vehicles passing within 70 m of the nest on both lightly and heavily used roads (Long and Ralph 1998, USFWS 2003). Dense vegetation (defined as being at least 30 m wide and 5 m tall and of sufficient density to completely block the visual pathway) has been shown to reduce the volume by as much as 5 dB for the first 30 m and an additional 5 dB for each contiguous 30 m (USFWS 2003). The average height of canopy for Marbled Murrelet nest trees in California is 64 m, which establishes a minimum distance from muzzle discharge as all WS actions will occur at ground level. While all of these factors combine to reduce the potential for serious disturbance to Marbled murrelet, the potential for infrequent, loud noises to cause a bird to flush, stand up while incubating eggs, or even flush off a nest exists and the canopy location makes monitoring Marbled murrelet response more difficult.

Species Specific Minimization Measure

To minimize the potential for negative impacts to Marbled murrelet when working to protect Marbled murrelet in Marbled murrelet habitat:

1. APHIS-WS will conduct all PDMTE activities from the ground.
2. APHIS-WS will use suppressors paired with subsonic ammunition to limit noise when using rifles for PDMTE in protection of Marbled murrelets.
3. APHIS-WS will avoid shooting up into the canopy where nests or murrelets may occur.

Western Snowy Plover

Description. The western snowy plover is a small shorebird with moderately long legs and a short neck. Their back is pale tan while their underparts are white, and have dark patches on the sides of their neck which reach around onto the top of their chest. Juveniles are similar to nonbreeding adults, but have scaly pale edging on their back feathers (USFWS 2016d).

During the breeding season, March through September, plovers can be seen nesting along the shores, peninsulas, offshore islands, bays, estuaries, and rivers of the Pacific Coast. Plover nests usually contain three tiny eggs, which are camouflaged to look like sand. Plovers will use almost anything they can find on the beach to make their nests, including kelp, driftwood, shells, rocks, and even human footprints.

Species Status and Distribution. The Pacific Coast population of the western snowy plover was designated a threatened species under the Endangered Species Act in March 1993 (Federal Register 58:12874: March 5; 1993). Poor reproductive success resulting from human disturbance, predation and inclement weather in combination with the loss of nesting habitat attributed to urban encroachment and the establishment of the exotic European beachgrass (*Ammophila arenaria*) were cited as factors contributing to the decline of the Pacific coast population of snowy plovers (USFWS 2001).

As detailed in the recovery plan for the Pacific Coast population of the western snowy plover (USFWS 2007), predation on plovers is a natural phenomenon; however, predation has been exacerbated by the inadvertent human encouragement of natural and exotic predator populations.

Numerous human caused factors have aided in increasing native predator species along the coast, and in addition, there are also introduced predators such as red fox. Because predator populations have increased and plover numbers are low, the impact predators can have on keeping plover numbers depressed are potentially serious.

Predation has been identified as a major factor limiting western snowy plover reproductive success at many Pacific coast sites (USFWS 2001). Documented causes of nest loss throughout the snowy plover's range include predation by American crows, common ravens, California gulls, red foxes, raccoons, coyotes, feral cats, skunks, and black rats (ODFW 1994). Known predators of eggs, chicks, or adults also include California ground squirrels, long tailed weasels, ring-billed gulls, western gulls, glaucous-winged *gulls,* American kestrels*,* peregrine falcons, northern harriers, loggerhead shrikes, merlins, great blue herons, Norway rats, Virginia opossums, domestic and feral dogs (USFWS 2001).

Currently it is estimated that about 2,000 snowy plovers breed along the Pacific Coast of the United States and at least another 2,000 along the west coast of Baja California (USFWS 2001, Page et al. 1995). Morrison et al. (2001) estimated 2,000 plovers breeding along the Pacific coast from Washington to Baja California and wintering on the Pacific coast from California to Baja California. Up to 2,500 plovers winter along the mainland California coast (Page et al. 1986). A detailed summary of the taxonomy and life history of this population occurs in the listing Final Rule for the western snowy plover (USDI 1993) and final recovery plan for the Pacific Coast population (USFWS 2007).

Designated Federal Critical Habitat for the Western snowy plover in California was revised in 2012 and encompasses 47 units totaling 16,337 acres (USFWS 2012b). APHIS-WS does not modify habitat and PDMTE will not cause changes in T&E species use of designated Critical Habitat.

Methods used and Species Specific Effects

Table 8. Methods used and Potential Impact on Western snowy plovers with rationale.

Predator Control Method	Western Snowy Plover
Grid Searches	LAA
Human Presence & Site Access	LAA
Pyrotechnics	LAA
Rodent snap traps	LAA
Shooting	LAA
Egg addling/destruction	NLAA- BE
Egg oiling	NLAA- BE
Euthanasia & disposal of captured predators	NLAA- BE
Bal-Chatri traps	NLAA-BE
Bow nets	NLAA-BE
Cage traps	NLAA-BE

Cannon/rocket nets	NLAA-BE
Catch poles	NLAA-BE
Decoy traps	NLAA-BE
Dho-gazza traps	NLAA-BE
Drift fencing	NLAA-BE
Drop nets	NLAA-BE
Foot/leg snares	NLAA-BE
Funnel Traps	NLAA-BE
Lasers	NLAA-BE
Mist nets	NLAA-BE
Neck/body snares	NLAA-BE
Nest box traps	NLAA-BE
Nest/walk-in traps	NLAA-BE
Net guns/launchers	NLAA-BE
Padded-jaw foot hold traps	NLAA-BE
Pidgeon harnesses	NLAA-BE
Pole traps	NLAA-BE
Scarecrows & Effigies	NLAA-BE
Spotlights	NLAA-BE
Swedish goshawk traps	NLAA-BE
Tube Traps	NLAA-BE
Neck/body snares	NE-1
DRC-1339	NE-1,2, 5
Barricades	NE-4
Barrier fencing	NE-4
Electric fencing	NE-4
Surface coverings	NE-4

Table 8 summarizes the potential effects of PDMTE activities/methods on Western snowy plovers. All activities involve APHIS-WS accessing the site to place or monitor equipment. To more clearly evaluate the potential effects of the individual methods on the species, site access/presence was considered as its own activity. As such, twenty seven methods (*see Table 8*) were found to be overall beneficial and not likely to adversely affect Western snowy plover. Neck/body snares were determined to have no effect on Western snowy plover due to equipment design. DRC-1339 was determined to have no effect on plovers due to design, deployment location, and use per EPA label instructions. Barricades, barrier fencing, electric netting, and surface coverings were not further evaluated as APHIS-WS is not the lead agency and does not implement these actions in the field. Human access/presence, pyrotechnics, shooting, grid searches, and rodent snap traps have the most potential to affect Western snowy plovers and are discussed further below.

Human access/presence on site could cause a temporary disturbance of Western snowy plovers.

Short term temporary disturbance includes a bird flushing, standing up while incubating eggs, flushing off the nest, circling and returning. Proximity to nest site, timing within the nesting cycle, duration and frequency of visits are all important factors as to whether an individual is disturbed to the level of harassment. If the disturbance is prolonged it could cause the abandonment of a specific nesting attempt. Birds are more likely to abandon nests early in the nesting cycle, before they have invested much energy in a particular nest. They are also much more likely to be harassed the longer the duration or more frequent the disturbance. The likelihood of predation may also increase if an incubation bird is off the nest too long. Despite these possibilities the goal of the program is for the benefit of the species. Use of vehicles or watercraft to access T&E protection sites could cause disturbance similar to that of human presence. In 2005, Sandoval reported that Western snowy plover nest abandonments (n=10) were higher than depredations (n=8), but in all other seasons predators by far have been the leading cause of nest loss (Kelly 2016). As APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment there is the potential to step on or otherwise accidently crush a nest. Close coordination with the site manager, biologists and monitors will be necessary to minimize any effects to Western snowy plovers.

The noise from **Shooting** and **Pyrotechnics** used to lethally remove or haze foraging predators from T&E sites, may cause temporary disturbance to Western snowy plovers. There is not a considerable amount of research on peak audio thresholds for disturbance of this species. Loud noises for sites on or near airports and military bases may be discountable when compared to the background noise already present on the site, but for sites that are more secluded there is the potential that even infrequent, loud noises could cause a bird to flush, stand up while incubating eggs, or even flush off a nest.

Grid searches for snakes have similar but potentially increased risk to cause direct effects on Western snowy plovers as site access and human presence. If APHIS-WS personnel will be operating in and around nesting areas conducting the search, there is the potential to step on or otherwise accidently crush a nest. Close coordination with the site manager, biologists and monitors will be necessary to minimize any effects to Western snowy plovers.

Rodent snap traps set to control rodents predating on the Western snowy plovers nests have the potential to capture plovers or chicks. Snap traps are typically located in areas where rodents frequent and not near known Western snowy plover nests or may be housed in elevated stations. No Western snowy plovers have been taken using snap traps set by the APHIS-WS PDMTE program, but the potential for capture still exists when conducting PDMTE for rodents predating.

Species Specific Minimization Measure

To minimize the potential for negative impacts to Western snowy plovers when working to protect Western snowy plover in Western snowy plover habitat:

1. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding plovers.

2. When entering a nesting area, activities shall be conducted as unobtrusively as possible and with the least amount of disturbance to the plovers. (Special Terms and Conditions for PRBO Permit 2001) Visits to trap sites near nests will be limited to minimize potential harassment and to minimize attracting other predators. Visits to control sites

will be done in cooperation with biologists monitoring the protected nests to best avoid disturbing incubating adult shorebirds.

3. Minimizing disturbance to western snowy plovers: APHIS-WS attempts to minimize disturbance to nesting western snowy plovers during certain climatic conditions such as high wind, extreme cold and extreme heat. As with terns, attempts are made to minimize the amount of time spent in western snowy plover nesting areas. (Special Terms and Conditions for PRBO Permit 2001)

4. The distance between trap sites and snowy plover nests will be as great as possible to eliminate or minimize any visual disturbance to the nests yet accomplish the specific predator control objective.

5. Hazing with pyrotechnics will be used only beyond 250 feet from a known Western snowy plover nest.

Salt Marsh Harvest Mouse

Description. The Salt marsh harvest mouse is a small native rodent which has an upper pelage of rich brown, underparts of cinnamon to buffy white, and a bicolored tail. Upper incisors grooved.

The life span of the salt marsh harvest mouse is about 8 to 12 months. This requires that the population renew itself every year in order to survive. While sexually active from March to November, females often bear only one of three possible litters. The average litter size is four offspring. If there is a nest, it is a loose ball of grasses on low vegetation or the surface of the ground. The salt marsh harvest mouse does not burrow. It is vulnerable to snakes, owls, hawks, and cats.

Species Status and Distribution. The Salt marsh harvest mouse inhabits tidal and non-tidal salt marshes and is found only around the San Francisco, San Pablo and Suisun Bays (CDFG 2003c). Compared with western harvest mice or house mice, salt marsh harvest mice are placid and dependent upon cover for protection from predators. Salt marsh harvest mice do not burrow. A Recovery Plan for the salt marsh harvest mouse and California clapper rail was prepared in 1984 (USFWS 1984). A 5 year review: Summary and Evaluation was prepared in 2010 (USFWS 2010b).

The salt marsh harvest mouse was designated as Endangered under the Endangered Species Act in October 1970 (Federal Register 35:16047; October 13, 1970). This species is threatened by loss and degradation of its habitat through human and human-induced activities. Adverse impacts to harvest mouse habitat have resulted from filling and conversion of marshes, invasion of non-native cordgrass and other non-native species, and pollution from urban run-off, industrial discharges, and sewage effluent. The harvest mouse itself likely is subject to predation by the non-native red fox and non-native feral cat (CDFG 2003c). CDFG (2003c) reported that in 1999 the status of the salt marsh harvest mouse was unknown. USFWS reported the population status of the southern subspecies is more precarious than that of the northern subspecies (USFWS 2010b).

Designated Federal Critical Habitat. No critical habitat rules have been published for the salt marsh harvest mouse.

Methods used and Species Specific Effects

Table 9. Methods used and potential impact on Salt marsh harvest mouse with rationale.

Predator Control Method	Potential Impact on Salt Marsh Harvest Mouse
Human Presence & Site Access	LAA
Bal-Chatri traps	NLAA- BE
Bow nets	NLAA- BE
Cage traps	NLAA- BE
Cannon/rocket nets	NLAA- BE
Catch poles	NLAA- BE
Decoy traps	NLAA- BE
Dho-gazza traps	NLAA- BE
Drop nets	NLAA- BE
Egg addling/destruction	NLAA- BE
Egg oiling	NLAA- BE
Euthanasia & disposal of captured predators	NLAA- BE
Foot/leg snares	NLAA- BE
Lasers	NLAA- BE
Mist nets	NLAA- BE
Neck/body snares	NLAA- BE
Nest box traps	NLAA- BE
Nest/walk-in traps	NLAA- BE
Net guns/launchers	NLAA- BE
Padded-jaw foot hold traps	NLAA- BE
Pidgeon harnesses	NLAA- BE
Pole traps	NLAA- BE
Pyrotechnics	NLAA- BE
Scarecrows & Effigies	NLAA- BE
Shooting (ground)	NLAA- BE
Spotlights	NLAA- BE
Swedish goshawk traps	NLAA- BE
Neck/body snares	NE- equipment design
DRC-1339	NE- equipment design, deployment location, & use per EPA label
Drift fencing	NE- not used in range of species
Funnel Traps	NE- not used in range of species
Grid Searches	NE- not used in range of species
Rodent Traps- snap type	NE- not used in range of species
Tube Traps	NE- not used in range of species

Barricades	NE- APHIS-WS is not the lead agency
Barrier fencing	NE- APHIS-WS is not the lead agency
Electric fencing	NE- APHIS-WS is not the lead agency
Surface coverings	NE- APHIS-WS is not the lead agency

Table 9 summarizes the potential effects of PDMTE activities/methods on the Salt marsh harvest mouse. All activities involve APHIS-WS accessing the site to place or monitor equipment. To more clearly evaluate the potential effects of the individual methods on the species, site access/presence was considered as its own activity. As such, twenty six methods (*see Table 9*) were found to be overall beneficial and not likely to adversely affect Salt marsh harvest mice. Neck/body snares were determined to have no effect on Salt marsh harvest mice due to equipment design. DRC-1339 was determined to have no effect on salt marsh harvest mice due to design, deployment location, and use per EPA label instructions. Reptile and Rodent control methods, including drift fencing, grid searching and funnel, tube, and snap traps will not be used in the range of Salt marsh harvest mice. Barricades, barrier fencing, electric netting, and surface coverings were not further evaluated as APHIS-WS is not the lead agency and does not implement these actions in the field. Human access/presence has the most potential to affect Salt marsh harvest mice and is discussed further below.

Human access/presence on site could cause a temporary disturbance of Salt marsh harvest mice. Short term temporary disturbance includes flushing. Use of vehicles or watercraft to access T&E protection sites could cause disturbance similar to that of human presence. As APHIS-WS personnel will be operating in and around salt marsh habitat deploying and monitoring equipment there is the potential to step on or otherwise accidently crush an individual salt marsh harvest mouse or knock down or potentially crush a grass nest of offspring. Close coordination with the site manager, biologists and monitors will be necessary to minimize any effects to Western snowy plovers. Whenever possible APHIS-WS avoids entering vegetation where Salt marsh harvest mouse are likely to shelter, but the potential for disturbance or direct effects are still present.

Species Specific Minimization Measure

To minimize the potential for negative impacts to salt marsh harvest mouse when working to protect salt marsh mouse in salt marsh harvest mouse habitat:

1. Rodent traps are not used within salt marsh harvest mouse habitat.

2. All due precautions will be taken to limit harm to salt marsh harvest mouse by establishing survey routes that incorporate existing roads, levees, and boardwalks whenever possible and by knowledge of where salt marsh harvest mouse reside and the ability to identify the salt marsh mouse.

3. All personnel will keep talking and other noise to a minimum near the marsh to reduce disturbance (USFWS 2016f).

Interrelated & Interdependent Effects. APHIS-WS euthanizes animals trapped during the course of PDMTE activities per direction from the American Veterinary Medical Association "Guidelines for Euthanasia of Animals: 2013 Edition". This includes the use of lethal gunshot and sodium pentobarbital. These actions can have no effect on the T&E species protected in this BA as they are performed on known, captured targets and the carcasses are not disposed of in the environment where they could attract predators or cause bioaccumulation.

Cumulative Effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area considered in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Cumulative impacts include habitat degradation from development, industrial pollution, habitat conservation, habitat improvement projects, recreation management, public education, and other recovery actions. PDMTE actions are designed to benefit threatened and endangered species by removing potential and actual predators that may threaten the continued existence of these species. T&E breeding areas are typically protected. APHIS-WS is the only agency using PDMTE tools in these areas so there will not be cumulative effects of these tools used by other entities. Whenever possible APHIS-WS coordinates T&E area entry with site managers & monitors to limit periods of disturbance.

Monitoring. The lead agency, in coordination with the cooperating agencies, would monitor the proposed action through annual review. This includes program impacts on all species listed as protected in the proposed action, review of the Biological Opinion, and re-consultation pursuant to Section 7 of the Endangered Species Act, if necessary.

APHIS-WS, in coordination with USFWS, CA State Parks, and CDFW and the land management agencies, would specifically monitor impacts on target and non-target species populations through its Management Information System (MIS) database, when APHIS-WS is involved in predator damage management protection. The MIS database information would be used along with other available data to determine the localized and cumulative impacts of the program on wildlife populations.

EFFECTS DETERMINATIONS

The long-term effects from implementing PDMTE program are anticipated to be beneficial to the protected species since these are identified as recovery actions designed to increase population recruitment. Specific predator control efforts have successfully been used as one aspect of the recovery efforts with other species such as the Aleutian Canada goose (*Branta Canadensis leucopareia*), California least tern (*Sterna antillarum browni*) and western snowy plovers in other areas (USFWS 2001). "Under status quo scenarios, even with intensive management in some areas, the population is almost certain to decline, and ceasing current management practices including area closures, predator control, and predator exclosures would be disastrous …" (Nur et al. 1999; USFWS 2002b).

California least tern. The PDMTE program is designed to benefit the overall population of California least tern by decreasing predation losses and increasing juvenile recruitment. To accomplish this, APHIS-WS must work in close proximity to colonies during the breeding season. APHIS-WS has determined that implementation of a proposed PDMTE program within the breeding habitat of the California least tern **may affect, and is likely to adversely affect** a small number of individual California least terns through disturbance and the potential for capture or nest trampling.

Despite the rare but present risks to a limited number of individual California least terns, APHIS-WS and the land/resource owners have determined the program is beneficial to the local colony and overall population.

Light-footed clapper rail. The PDMTE program is designed to benefit the overall population of light-footed clapper rails by decreasing predation losses and increasing juvenile recruitment. To accomplish this, APHIS-WS must work in close proximity to Light-footed clapper rails. APHIS-WS has determined that implementation of a PDMTE program within the habitat of the light-footed clapper rail **may affect, and is likely to adversely affect** a small number of individual Light-footed clapper rails through disturbance and the potential for knocking down or trampling a nest. Despite the rare but present risks to a limited number of individual Light-footed clapper rails, APHIS-WS and the land/resource owners determined the program is beneficial to the local and overall.

California clapper rail. The PDMTE program is designed to benefit the overall population of California clapper rails by decreasing predation losses and increasing juvenile recruitment. To accomplish this, APHIS-WS must work in close proximity to California clapper rails. APHIS-WS has determined that implementation of a PDMTE program within the habitat of the California clapper rail **may affect, and is likely to adversely affect** a small number of individual California clapper rails through disturbance and potential for knocking down or trampling a nest. Despite the rare but present risks to a limited number of individual California clapper rails, APHIS-WS and the land/resource owners determined the program is beneficial to the local and overall population.

Marbled murrelet. The PDMTE program is designed to benefit the Marbled murrelet by decreasing predation losses and increasing juvenile recruitment. To accomplish this, APHIS-WS must work in close proximity to nest trees during the breeding season. APHIS-WS has determined that implementation of a PDMTE program within the breeding habitat of the Marbled murrelet **may affect, and is likely to adversely affect** a small number of individual Marbled murrelets through disturbance. Despite the rare but present risks to a limited number of individual Marbled murrelets, APHIS-WS and the land/resource owners have determined the program is beneficial to the local nesting area and overall population. APHIS-WS does not modify habitat and PDMTE will have **no effect** on designated Critical Habitat of Marbled murrelets.

Western snowy plover. The PDMTE program is designed to benefit the overall Pacific coast population of the western snowy plover by decreasing predation losses and increasing juvenile recruitment. APHIS-WS has determined that implementation of a PDMTE program within the breeding habitat of the Pacific coast population of the Western snowy plover **may affect, and is likely to adversely affect** a small number of individual Western snowy plover through disturbance and potential for capture or nest trampling. Despite the rare but present risks to a limited number of individual Western snowy plover, APHIS-WS and the land/resource owners have determined the program is beneficial to the local colony and overall population. APHIS-WS does not modify habitat and PDMTE will have **no effect** on designated Critical Habitat of Western snowy plovers.

Salt marsh harvest mouse. The PDMTE program is designed to benefit the overall population of Salt marsh harvest mouse by decreasing predation losses. To accomplish this, APHIS-WS must work in close proximity to Salt marsh harvest mice. APHIS-WS has determined that implementation of a PDMTE program within the habitat of the salt marsh harvest mouse **may affect, and is likely to adversely affect** a small number of individual salt marsh harvest mice**.** Despite the rare but present risks to a limited number of individual Salt marsh harvest mouse, APHIS-WS and the land/resource owners have determined the program is beneficial to the local and overall population.

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Appendix A. List of Coastal Project Sites where APHIS-WS is currently conducting PDMTE in California.

Project	Species Protected	Target Species	Cooperator	WS District	Counties	USFWS ES Region
Mare Island Naval Shipyard	CLRA, SMHM	Feral Cat, Coyote, Opossum, Raccoon, Striped skunk, California ground squirrel	City of Vallejo	Sacramento	Solano	Bay Delta, Sacramento ES
Point Reyes National Seashore	WSPL	Ravens	National Park Service	Sacramento	Marin	Bay Delta, Sacramento ES
Sonoma Marin Area Rapid Transit	SMHM, CLRA	Feral cat, dog, Red fox, Raccoon, Striped skunk, Opossum, Coyote, bobcat, black rat, Norway rat, weasel, grey fox	Sonoma Marin Area Rapid Transit (SMART)	Sacramento	Marin	Bay Delta, Sacramento ES
Chevron USA	CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog	Chevron USA	Central	Contra Costa	Bay Delta, Sacramento ES
East Bay Regional Park-Private	WSPL, LETE, CLRA, SMHM	Feral cat, Red fox, Raccoon, Striped skunk, California gull	East Bay Regional Park	Central	Alameda & Contra Costa	Bay Delta, Sacramento ES
SF Bay Project - Moffett/Ames (NASA)	CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog	NASA	San Luis	Santa Clara	Bay Delta, Sacramento ES
SF Bay Project - SF Bay NWRC	WSPL, CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog, American Crow, Raven, Red-tailed hawk, Northern Harrier, Peregrine falcon, Western gull, California gull	USFWS	San Luis	Alameda, Santa Clara, & San Mateo	Bay Delta, Sacramento ES

SF Bay Project - Private	WSPL, CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog, American Crow, Raven, Red-tailed hawk, Northern Harrier, Peregrine falcon, Western gull, California gull	USFWS, CDFW	San Luis	Alameda, Santa Clara, & San Mateo	Bay Delta, Sacramento ES
SF Bay Project - State	WSPL, CLRA, SMHM, LETE	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog, American Crow, Raven, Red-tailed hawk, Northern Harrier, Peregrine falcon, Western gull, California gull	CDFW	San Luis	Alameda & San Mateo	Bay Delta, Sacramento ES
SF Bay Project - Zanker Landfill	WSPL, CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog, American Crow, Raven, Red-tailed hawk, Northern Harrier, Peregrine falcon, Western gull, California gull	Private	San Luis	Santa Clara	Bay Delta, Sacramento ES
SF Bay Project - Newby Island Landfill	WSPL, CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog, American Crow, Raven, Red-tailed hawk, Northern Harrier, Peregrine falcon, Western gull, California gull, Glaucous gull, Glaucous-winged gull, Herring gull, Black rat	Private	San Luis	Santa Clara	Bay Delta, Sacramento ES

SF Bay Project - City	WSPL, CLRA, SMHM	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, Opossum, Dog	Redwood city, East Palo Alto, Palo Alto, Sunnyvale, and Union Sanitation Districts	San Luis	Alameda, Santa Clara, & San Mateo	Bay Delta, Sacramento ES
Half Moon Bay -State	WSPL	Red fox, Striped skunk, Opossum, Raccoon, Raven, Feral cat, American Crow	CSPR	San Luis	San Mateo	Bay Delta, Sacramento ES
Alameda Point/NAS Alameda - Federal	LETE	Gray fox, Red fox, Dog, Feral cat, European Starling, Striped skunk, Norway rat, Opossum, Raccoon, Loggerhead shrike, American kestrel, Northern harrier, Great Horned Owl, California gull, Western gull, Great egret, Snowy egret, Great blue heron, Black-crowned Night heron, Red-tailed Hawk, Cooper's hawk, American Crow, Black rat, Peregrine falcon, Barn owl, Burrowing owl, Sharp-shinned hawk, Merlin, White-tailed kite, and Osprey.	VA, USFWS, ACOE	San Luis	Alameda	Bay Delta, Sacramento ES

Alameda Point/ NAS Alameda - City	LETE	Gray fox, Red fox, Dog, Feral cat, European Starling, Striped skunk, Norway rat, Opossum, Raccoon, Loggerhead shrike, American kestrel, Northern harrier, Great Horned Owl, California gull, Western gull, Great egret, Snowy egret, Great blue heron, Black-crowned Night heron, Red-tailed Hawk, Coopers hawk, American Crow, Black rat, Peregrine falcon, Barn owl, Burrowing owl, Sharp-shinned hawk, Merlin, White-tailed kite, and Osprey.	City of Alameda	San Luis	Alameda	Bay Delta, Sacramento ES
Monterey Bay Project- Salinas River NWR	WSPL	Feral Cat, raccoon, Red fox, Striped skunk, Opossum, Feral dog, Coyote, American Crow, Raven, Red-tailed hawk, Northern harrier, Peregrine falcon, Barn owl, Great Horned owl, Loggerhead shrike, Western gull, California gull.	USFWS	San Luis	Monterey	Ventura ES

Monterey Bay Project-Private	WSPL	Feral Cat, raccoon, Red fox, Striped skunk, opossum, Feral dog, American Crow, Raven, Red-tailed hawk, Northern harrier, Peregrine falcon, Barn owl, Great Horned owl, Loggerhead shrike, Western gull, California gull, Coyote.	USFWS, CDFW, CA State Parks	San Luis	Monterey & Santa Cruz	Ventura ES
Monterey Bay Project-State	WSPL	Feral Cat, raccoon, Red fox, Striped skunk, opossum, Feral dog, American Crow, Raven, Red-tailed hawk, Northern harrier, Peregrine falcon, Barn owl, Great Horned owl, Loggerhead shrike, Western gull, California gull, Coyote.	CDFW & CSPR	San Luis	Monterey & Santa Cruz	Ventura ES
California State Parks-Santa Cruz District	MAMU, WSPL	MAMU- Ravens, American Crow, Steller's jay. WSP- Coyote, Red fox, Striped Skunk, European starling, Owls, Osprey, Crow, Raven, Loggerhead shrike, American kestrel, Northern Harrier, Western gull, Great egret,	CSPR	San Luis	Santa Cruz	Ventura ES

		Snowy egret, Great Blue heron, Black-crowned Night Heron, Red-tailed Hawk, Coppers hawk.				
Oceano Dunes State Vehicular Recreation Area	WSPL, LETE	Coyote, Red fox, Striped Skunk, European starling, Owls, Osprey, Crow, Raven, Loggerhead shrike, American kestrel, Harrier, Western gull, Great egret, Snowy egret, Great Blue heron, Black-crowned Night Heron, Red-tailed Hawk, Cooper's hawk.	CSPR	San Luis	San Luis Obispo	Ventura, Sacramento ES
Guadalupe-Rancho Dunes	WSPL, LETE	Coyote, Feral Cat, raccoon, Red fox, Striped skunk, opossum, Feral dog, American Crow, Raven, Red-tailed hawk, Northern harrier, Peregrine falcon, Barn owl, Great Horned owl, Loggerhead shrike, Western gull, California gull.	Santa Barbara County	San Luis	Santa Barbara	Ventura ES
Morro Bay	WSPL	American Crow, Raven, Red fox, California ground squirrel, Feral cat, Raccoon, Striped skunk, California gull, Western gull.	CSPR	San Luis	San Luis Obispo	Ventura, Sacramento ES

Guadalupe-Nipomo Dunes NWR	WSPL, LETE	Coyote, Feral Cat, raccoon, Red fox, Striped skunk, opossum, Feral dog, American Crow, Raven, Red-tailed hawk, Northern harrier, Peregrine falcon, Barn owl, Great Horned owl, Loggerhead shrike, Western gull, California gull.	USFWS	San Luis	San Luis Obispo	Ventura, Sacramento ES
Guadalupe Restoration Project - Chevron	WSPL	Feral swine, Feral Cat, raccoon, Red fox, Striped skunk, opossum, Feral dog, American Crow, Raven, Red-tailed hawk, Northern harrier, Peregrine falcon, Barn owl, Great Horned owl, Loggerhead shrike, Western gull, California gull.	Chevron USA	San Luis	San Luis Obispo	Ventura, Sacramento ES
Carpinteria Marsh	LFRR	American crow, Red fox, Virginia opossum, Common raven, Striped skunk	UC Santa Barbara	San Luis	Santa Barbara	Ventura ES
Coal Oil Point	WSPL	Striped skunk, Raccoons, Barn owl, Great Horned owl, Opossum, Red-tailed hawk, American Crow, Raven	UC Santa Barbara	San Luis	Santa Barbara	Ventura ES
Port of San Diego- D Street Fill, Chula Vista Wildlife Reserve, & Lindbergh Field	WSPL, LETE	Feral Cat, Gray fox, Red fox, Coyote, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway	San Diego Unified Port District & San Diego Regional Airport Authority. (D Street Fill) USFWS and Port of San	South	San Diego	Carlsbad ES

		rat, Opossum, Dog, American Crow, Raven, gulls, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine Falcon.	Diego			
San Diego NWR Complex-Tijuana Slough NWR	LETE, WSPL, LFRR	CLT & WSP= Feral cat, Gray fox, Red fox, Coyote, Bobcat, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, European starling, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine falcon. LFCR= Feral cat, dog, Red fox, Striped skunk, opossum, rat species.	USFWS	South	San Diego	Carlsbad ES
San Diego NWR Complex-Borderfield State Park	LETE, WSPL, LFRR	CLT & WSP= Feral cat, Gray fox, Red fox, Coyote, Bobcat, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, European	CA Dept. Parks and Recreation, funded by USFWS	South	San Diego	Carlsbad ES

		starling, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine falcon. LFCR= Feral cat, dog, Red fox.				
San Diego NWR Complex-Sweetwater Marsh NWR	LETE, WSPL, LFRR	CLT & WSP= Feral cat, Gray fox, Red fox, Coyote, Bobcat, Stripe skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, European starling, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine falcon. LFRR= Feral cat, dog, Red fox, Striped skunk, opossum, rat species.	USFWS	South	San Diego	Carlsbad ES

San Diego NWR Complex- San Diego Bay NWR	LETE, WSPL, LFRR	CLT & WSP= Feral cat, Gray fox, Red fox, Coyote, Bobcat, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, European starling, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine falcon. LFRR= Feral cat, dog, Red fox, Striped skunk, opossum, rat species.	USFWS	South	San Diego	Carlsbad ES
Mission Bay- Mariner's Point, North Fiesta Island, & Stoney Point	LETE	Feral cat, Gray fox, Red fox, Coyote, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, European starling, Barn owl, Burrowing owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead Shrike, Great Blue heron, Peregrine falcon, King Snake, Garter Snake, Gopher Snake, Pacific Rattlesnake, Diamond Rattlesnake.	City of San Diego Parks and Rec. & SANDAG	South	San Diego	Carlsbad ES

Batiquitos Lagoon Project	LETE, WSPL	Feral Cat, Gray fox, Red fox, Coyote, Bobcat, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, peregrine falcon.	CDFW	South	San Diego	Carlsbad ES
San Dieguito Lagoon -	LETE, WSPL	Feral Cat, Gray fox, Red fox, Coyote, Bobcat, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine falcon.	San Diego Natural History Museum & 22nd District Agricultural Association	South	San Diego	Carlsbad ES

Kendall-Frost Mission Bay Marsh Reserve	LFCR	Feral Cat, Gray fox, Red fox, Raccoon, Striped skunk, California ground squirrel, Black rat, Norway rat, Opossum, Dog	City of San Diego Parks & Rec.	South	San Diego	Carlsbad ES
Point Mugu Naval Base	LETE, WSPL, LFRR	Feral Cat, Gray fox, Red fox, Coyote, Striped skunk, California ground squirrel, Long tailed weasel, Black rat, Norway rat, Opossum, Dog, American Crow, Raven, gulls, Barn owl, Burrowing owl, Great Horned owl, American kestrel, Red-tailed hawk, Cooper's hawk, Harrier, Loggerhead shrike, Great Blue heron, Peregrine falcon.	US Navy	South	Ventura	Ventura ES

FAA Island	LETE	American Crow, Raven, gulls, European starling, Barn owl, Burrowing owl, American kestrel, Red-tailed hawk, Cooper's hawk, Northern Harrier, Logger-headed shrike, great blue heron, Peregrine falcon, and commensal rodents.	San Diego Association of Governments (SANDAG), FAA	South	San Diego	Carlsbad ES

APPENDIX B

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.101 07/20/09

SELECTING WILDLIFE DAMAGE MANAGEMENT METHODS

1. PURPOSE

To provide guidelines used for basic decision-making, selection of management methods and techniques, and program direction.

2. REPLACEMENT HIGHLIGHTS

This directive replaces WS Directive 2.101 dated 10/29/03.

3. BACKGROUND

Wildlife damage management (WDM) is practiced as a field of specialization within the wildlife management profession. WS personnel may provide services via technical assistance, direct-control assistance, or both. Technical assistance and direct-control assistance encompass the use of nonlethal and lethal management methods. In some situations such as livestock protection, the number of nonlethal methods available to the professional wildlife damage specialist for use in direct-control assistance is currently limited. Most of these nonlethal methods focus on management of the affected resource and not on control of the offending animal. In these instances, WS involvement in using nonlethal methods may be limited to technical assistance recommendations which are more appropriately applied by the resource owner. These methods may include the use of livestock guarding animals, the electronic guard or other noise making device, predator-proof fencing, fladry, shed lambing, herding, and night penning. In other situations such as the protection of aquaculture, seed crops, and airport safety, control methods may include bird dispersal techniques and repellents, cattail management for blackbird control, or grass management at airports. To continue providing Federal leadership in managing problems caused by wildlife, WS supports and promotes scientific research to develop and improve WDM methods and to provide science-based information for WDM.

WS activities are developed, conducted, and/or supervised by professionals who are knowledgeable in the biological, ecological, economic, and social principles that govern wildlife management decisions. Periodic field inspections, program audits, report monitoring, and customer feedback help to ensure program compliance with applicable laws, regulations, and policies.

4. POLICY

When responding to requests for assistance, WS may provide technical assistance, direct control assistance, and/or research assistance. Technical and direct control assistance, as defined below, may involve the use of either lethal or nonlethal methods, or a combination of the two. Preference is given to nonlethal methods when practical and effective.

a. Technical Assistance. Technical assistance is defined as advice, recommendations, information, equipment, literature, instructions, and materials provided to others for use in managing wildlife damage problems and understanding wildlife damage management principles and techniques.

b. Direct Control Assistance. Direct control assistance is defined as field activities conducted or supervised by WS personnel.

1. Direct control assistance may be implemented when it has been determined that a problem cannot reasonably be resolved by technical assistance or that the professional skills of WS employees are required for effective problem resolution. Direct control assistance is often initiated when the wildlife damage involves several ownerships, sensitive species, application of WS restricted-use pesticides, or complex management problems requiring the direct supervision of a professional wildlife manager or biologist.

2. Direct control operations will be conducted upon request only with the written authorization of the landowner, cooperator, other authorized officials, or in accordance with another appropriate instrument such as a memorandum of understanding.

Wildlife damage management strategies can be either preventive (applied before damage begins) or corrective (applied when damage is in progress). The decision process used to formulate WS program responses to requests for assistance is shown in WS Directive 2.201, WS Decision Model.

5. SELECTION OF MANAGEMENT METHODS

The WS program applies an integrated WDM approach to reduce or prevent wildlife damage. In selecting damage management techniques for specific wildlife damage situations, consideration must be given to the species responsible and the frequency, extent, and magnitude of damage. In addition to damage confirmation and assessment, consideration must be given to the status of target and potential nontarget species, local environmental conditions, relative costs of applying management techniques, environmental impacts, and social and legal concerns. These factors must be evaluated in formulating management strategies and may include the application of one or more techniques.

6. REFERENCE

ADC Final Environmental Impact Statement, Chapter 1.C.2 - Wildlife Damage Management, pp 3-7 (October 1997).
ADC Final Environmental Impact Statement, Appendix J, Methods of Control, pp 1-14 (October 1997).
WSDirective 2.105, The WS Integrated Wildlife Damage Management Program (03/01/04).
WS Directive 2.201, WS Decision Model (07/20/09).

Deputy Administrator, Acting

United States Department of Agriculture
Animal and Plant Health Inspection Service

Wildlife Services Directive

2.201
July 15, 2014

WS DECISION MODEL

1. PURPOSE

To provide Wildlife Services (WS) personnel with a systematic approach to decision-making for wildlife damage management activities.

2. REPLACEMENT HIGHLIGHTS

This directive revises WS Directive 2.201 dated July 21, 2008.

3. AUTHORITY

Authority to promulgate a policy is pursuant to The Act of March 2, 1931, (46 Stat. 1468; 7 USC 426), as amended:

Section 426. Predatory and other wild animals.
"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day October 28, 2000."

4. POLICY

a. The WS Decision Model is intended to conceptualize and describe the thought process involved in addressing wildlife damage problems. It is not intended to require documentation or a written record each time it is used.

b. This directive provides WS personnel with a step-by-step approach to help address requests for assistance with wildlife damage. The major aspects presented in the WS Decision Model should be used when responding to requests for assistance.

5. BACKGROUND

a. Wildlife damage management focuses on reducing conflicts between humans and wildlife that occur when wildlife negatively impact agricultural and natural resources, properties, and public health and safety. The WS decision making process is a thought process for evaluating and responding to wildlife damage problems, and is similar in approach to the decision making process used within other professions. WS professionals evaluate the appropriateness of strategies, and methods are evaluated for their availability (i.e., legal and administrative) and suitability based on biological, economic, environmental and social considerations. Following the thought process, the methods deemed practical for the situation are developed into a management strategy. The WS Decision Model is designed to serve as a useful management tool and meaningful communication instrument; however, it necessarily oversimplifies complex thought processes.

6. IMPLEMENTATION

The following discussion is depicted in Attachment 1.

a. Receive Request For Assistance. Wildlife damage management services are provided only in response to requests for assistance.

b. Assess Problem. First, a determination should be made as to whether the problem is within the authority of WS. If it is, damage information should be gathered and analyzed to determine factors such as what species was responsible for the damage; the type, extent, and magnitude of damage; the current economic loss and potential losses; the local history of damage; and what management methods, if any, were used to reduce past damage and the results of those actions.

c. Evaluate Management Methods. Once a problem assessment is completed, an evaluation of management methods must be conducted. Methods should be evaluated in the context of their legal and administrative availability and their acceptability based on biological, environmental, social, and cultural factors.

d. Formulate Management Strategy. Methods determined to be practical for use are formulated into a management strategy. The concept of IWDM (WS Directive 2.105, The WS Integrated Wildlife Damage Management Program) should be applied when formulating each management strategy. This approach encourages the use of several management techniques rather than relying on a single method. Consideration of factors such as available expertise, legal constraints on methods used, costs, and effectiveness is essential in formulating each management strategy.

e. Provide Assistance. Program service can be provided by two basic means: technical assistance and direct management (WS Directive 2.101, Selecting Wildlife Damage Management Methods).

f. Monitor and Evaluate Results of Management Actions. When direct management is provided, it is necessary to monitor the results. Monitoring is important for determining whether further assistance is required or whether the problem has been resolved.

Evaluation is used to determine whether additional techniques are necessary.

g. <u>End of Project</u>. With technical assistance, the projects normally end after recommendations or advice are provided to the requestor. An operational project normally ends when WS personnel have stopped or reduced the damage to an acceptable level. Problems such as chronic predation on livestock or at aquaculture facilities may require continuing or intermittent attention and may have no well-defined end point.

6. APPLICABLITY

This applies to all WS employees and programs.

7. REFERENCES

a. WS Directive 2.101, Selecting Wildlife Damage Management Methods (10/29/03); www.aphis.usda.gov/wildlife_damage/directives/2.101.pdf
b. WS Directive 2.105, The WS Integrated Wildlife Damage Management Program (03/01/04); www.aphis.usda.gov/wildlife_damage/directives/2.105.pdf

William H. Clay

Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.301 05/05/06

MIGRATORY BIRD DAMAGE MANAGEMENT

4. PURPOSE

To provide guidance for managing damage caused by migratory birds to agriculture, aquaculture, natural resources, property, and human health and safety.

5. REPLACEMENT HIGHLIGHTS

This directive revises WS Directive 2.301 dated 07/28/03.

6. BACKGROUND

Wildlife Services (WS) has the Federal responsibility to respond to damage caused by migratory birds. To implement its bird damage management programs, WS will initiate an integrated approach of non-lethal and/or lethal bird control activities, in partnership with the public and private sector, including State and Federal agencies. WS authority to conduct migratory bird damage management derives from permits issued by Fish and Wildlife Service (FWS) under 50 CFR 21.41.

No Federal permit is required to scare, harass, or herd depredating migratory birds other than migratory birds that are also listed as endangered or threatened species and bald or golden eagles (refer to WS Directive 2.310, Endangered and Threatened Species and WS Directive 2.315, Eagle Damage Management, for specific guidelines.).

4. POLICY

WS will provide assistance upon request to the public and private sector to resolve migratory bird damage problems by implementing wildlife damage management activities in accordance with applicable Federal, State, and local laws and regulations. WS assistance will occur as part of an integrated wildlife damage management program and may consist of technical assistance, direct management assistance, and/or research.

WS will, when appropriate, enter into cooperative funded agreements that provide assistance for long-term and/or short-term damage management programs. WS can also conduct damage management programs pursuant to Memorandum of Understandings (MOU) with State agencies. For assistance to the public and/or private sector seeking Federal migratory bird depredation permits, WS personnel may conduct damage assessments to obtain information on which to base bird damage management
recommendations.

6. ASSISTANCE

a. <u>Technical Assistance</u>.

1. Biological information, legal considerations, endangered species concerns, and management options relative to the species involved in the damage or nuisance problem will be provided to the private sector. Information concerning FWS depredation permit requirements and application procedures will be made available upon request.

2. Demonstration and instruction of wildlife damage management techniques will be offered when feasible. Time, material, and/or travel associated with formal training may be reimbursed.

3. The services of a private wildlife damage management business may be recommended when appropriate.

4. Bird damage management equipment may be made available to the public for demonstration purposes, temporary loan or purchase.

b. <u>Operational Assistance</u>.

1. Direct management assistance to control bird damage may be provided by WS personnel to public/private cooperators.

2. WS offices are authorized to enter into MOUs, cooperative agreements, interagency agreements, and partnerships (Directive 3.101) to implement bird damage management programs.

c. <u>FWS Migratory Bird Depredation Permits (50 CFR 21.41)</u>.

1. <u>WS Personnel Only</u>. WS personnel will obtain, as appropriate, Federal permits that authorize the take of migratory birds, shall identify WS employees as the agents authorized to act under the permit authority, shall comply with all permit conditions, and shall obtain state permits as necessary. Application and renewals of such permits will be coordinated with the appropriate FWS Regional Office.

2. <u>Cooperators and the Public</u>. WS will assist Federal permit applicants by providing management recommendations. To assist cooperators and the public, WS will utilize WS Permit Review Form 37:

(i). Form 37 will be used by WS to provide FWS the basic information (as identified in regulatory language 50 CFR 21.41) required as part of the migratory bird depredation permitting process.

(ii). If during the permit application process, FWS requests information beyond what is required by regulation (50 CFR 21.41) and/or already provided in Form 37, State Directors are authorized to enter into an Interagency Agreement with FWS to collect reimbursement to defray cost for collecting, compiling, and providing FWS any additional information.

(iii). Compensation for collecting additional information will be set at a minimum of the employees hourly pay rate. State Directors are also authorized to negotiate per diem and other travel cost reimbursement rates (e.g. motor vehicle expenses) at their discretion.

6. REFERENCES

WS Directive 2.310, Endangered and Threatened Species (07/28/03). WS
Directive 2.315, Eagle Damage Management (08/05/03).
WS Directive 3.101, Interfacing with Business in Establishing Cooperative Programs (05/25/05).
Bald Protection Act of 1940 (16 U.S.C. 668a-668d), as amended.
Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended.
Lacey Act (18 U.S.C. 42), as amended.
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712), as amended. 50
CFR Part 10 - General Provisions/List of Migratory Birds.
50 CFR Part 13 - General Permit Procedures. 50
CFR Part 21 - Migratory Bird Permits.

William H. Clay
Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.310 07/28/03

ENDANGERED AND THREATENED SPECIES

7. PURPOSE

To establish guidelines for WS activities associated with federally listed endangered and threatened species.

8. REPLACEMENT HIGHLIGHTS

This directive replaces ADC Directive 2.310 dated 3/26/93.

3. POLICY

WS will conduct its activities to minimize impact on any federally listed endangered or threatened species or adversely modifying listed critical habitat.

The Director of the WS Operational Support Staff is responsible for notifying WS State Directors of any new or proposed Federal listings of endangered or threatened species. State Directors are responsible for knowing all federally proposed and listed endangered and threatened species and designated critical habitats that occur in their area of responsibility, and for conducting their program activities in a manner consistent with this policy.

WS State Directors will assure that all of their WS employees (Federal and non-Federal) are familiar with the requirements of Section 7 of the Endangered Species Act, as amended. WS employees will also be familiar with Section 7 biological opinions on listed species potentially impacted by their wildlife damage management activities. WS State Directors will initiate consultation with the U.S. Fish and Wildlife Service (FWS) if new damage management programs, new methods, or newly listed species result in the potential for adverse impacts.

During routine work activities, incidents involving impacts on listed species will be reported by WS field personnel within 24 hours to the appropriate WS supervisor.

Unless otherwise authorized, the location of dead or seriously injured listed species will be immediately reported to the appropriate FWS Law Enforcement Office and State wildlife representative.

When endangered species are responsible for causing damage, the WS State Director will work with the FWS to determine if acceptable solutions for controlling damage can be agreed upon and implemented.

When a managing agency (Federal, state, tribal) requests WS assistance in protecting listed species or controlling damages caused by listed species, the requesting agency will bear responsibility for funding the work. The WS State Director will coordinate with appropriate Federal, state, and local agencies to arrange funding and determine acceptable control procedures.

4. REFERENCES

50 CFR Part 17 - Endangered and Threatened Wildlife and Plants.
50 CFR Part 402 – Interagency Cooperation.
Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended.

William H. Clay

Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

Wildlife Services Directive

2.450
September 24, 2014

TRAPS AND TRAPPING DEVICES

1. PURPOSE

To establish guidelines for WS personnel for using certain types of animal capture devices in managing wildlife damage.

9. REPLACEMENT HIGHLIGHTS

This directive revises Wildlife Services Directive 2.450, Traps and Trapping Devices, dated March 10, 2004.

10. AUTHORITY

Authority to assist federal, state, local, and foreign agencies and individuals with regard to wildlife damage and control is pursuant to Title 7 Code of Federal Regulation (7 CFR) § 371.6.

4. POLICY

7. The use of all traps, snares (cable device), and other animal capture devices by WS employees will comply with applicable federal, state, and local laws and regulations related to animal capture for managing wildlife damage (WS Directive 2.210, *Compliance with Federal, State, and Local Laws and Regu./ations).*

8. Traps and trapping devices will not be used unless appropriate authorization is granted by landowner or designee (WS Form 12A, 12B, 12C, 12D or 12F).

c. All exceptions to this operational policy must be authorized by the appropriate WS Regional/NWRC Director.

5. BACKGROUND

WS recognizes the value and use of the trapping Best Management Practices (BMP) guidelines

for private fur harvest and other trapping activities developed and promulgated by State wildlife management agencies and The Association of Fish and Wildlife Agencies. WS recognizes that these guidelines for different regions of the United States for 20 species of North American mammals will be periodically updated based on the availability and public use of commercial capture devices. WS intends to utilize these guidelines as a basis for policy formulation, recognizing that some devices used in wildlife damage management are not commercially available and that not all devices recommended in the BMP guidelines for general public use meet the more stringent performance requirements for efficiency and durability, for use in WS wildlife management activities.

6. IMPLEMENTATION

a. All traps and trapping devices are to be checked no less frequently than required by state law, unless specific exemptions are obtained.

b. All traps used by WS will be labeled (Property of U.S. Government, Property of USDA, Property of Texas, etc., as appropriate), either with an attached tag or stamped directly on the trap.

c. All traps and trapping devices will be set in a manner which minimizes the chances of capturing nontarget species. If possible, non-target animals that are captured will be released.

d. If an animal that appears to be a licensed pet is captured; reasonable efforts will be made to notify the owner, to seek veterinary assistance if necessary, or deliver the animal to appropriate local authorities.

e. Animals targeted for lethal control in direct control projects will be dispatched immediately, removed from capture devices, and properly disposed (WS Directive 2.505, Euthanizing Wildlife; WS Directive 2.510, Fur, Other Animal Parts, and Edible Meat; WS Directive 2.515, Disposal of Wildlife Carcasses).

f. Captured animals intended for release, relocation, or captivity will be handled and transported appropriately to achieve project objectives (WS Directive 2.501, Translocation of Wildlife).

g. Appropriate warning signs will be posted on main entrances or commonly used access points to areas where foot-hold traps, snares (cable device), or rotating jaw (body-grip or Conibear-type) traps are in use. Signs will be routinely checked to assure they are present, obvious, and readable. Signs must be removed when equipment is no longer in use.

h. Foot-hold Traps and Snares (cable device). Foot-hold traps or snares (cable device) are

not to be set closer than 30 feet from any exposed animal carcass or part thereof, having meat or viscera attached, including remains of animals previously removed from traps or snares (cable device) that may attract raptors or other nontarget animals. If an animal carcass could be dragged or moved by scavengers to within 30 feet of set foot-hold traps, snares (cable device), the carcass will be secured to restrict movement (WS Directive 2.455, Scents, Baits, and Attractants). These restrictions do not apply to animal carcasses used to attract bear or mountain lion to approved capture devices or to foot-hold traps set for the purpose of live-capturing birds, as approved by the WS State Director.

(1) The use of foot-hold traps and spring activated leg snares (cable device) must incorporate pan-tension devices as appropriate to prevent or reduce the capture of nontarget animals, unless such use would preclude capture of the intended target animals. Certified WS employees are authorized to use tranquilizer trap devices (TTD) to manage nuisance wildlife.

(2) Foot-hold traps with an inside jaw spread greater than 5 Y:z inches, when used in restraining sets, are limited to types with smooth, offset jaws that may or may not be laminated or to padded-type jaws. Foot-hold traps with teeth or spiked jaws are prohibited. WS Regional Director may authorize use of modified jaw protrusions on traps for the purpose of reducing injuries to target animals.

(3) Unless specifically authorized by the WS State/NWRC Director, new traps/capture devices should be selected from the various commercially available devices or equivalents listed in regional Best Management Practices guidelines for each species.

(4) If it is necessary to use foot-hold traps or snares (cable device) under fence lines, reasonable efforts should be taken to obtain the approval of adjacent landowners where applicable; judgment should be used to avoid capture of livestock and other domestic animals.

(5) The use of break-away locks or stops is encouraged when livestock, deer, or other large animals may be exposed to snare (cable device) sets.

(6) Capture devices should be set to minimize visibility of captured animals.

(7) Appropriate notification signs must be posted with in the direct line of sight of bear and lion foot-snare (cable device) sets.

(8) Foot-hold traps (long spring or coil spring) will not be used to take bear.

1. Pole Traps. Foot-hold traps, leg snares (cable device), or tangle snares may be set on poles or roosting structures to capture birds. If such devices are authorized by the

applicable depredation permit appropriate federal, state, and local special purpose permits shall be obtained and in the possession of the authorized WS person when performing the capture function.

(1) Traps should not have an inside jaw spread greater than 5" for most raptors. This limitation does not preclude the use of larger, modified traps to capture eagles. Trap springs should be modified to produce the lightest jaw closure sufficient to catch and hold the target raptor. Trap jaws should be sufficiently padded to reduce the possibility of injury to the birds.

(2) To reduce unnecessary stress to the captured birds, traps will be checked at least twice daily, but not less than required by appropriate permit(s); a slide wire, or similar device, shall be used to allow the raptor to rest on the ground.

J. Rotating Jaw Traps (body-grip trap). Rotating jaw (body-grip, Conibear-type) traps with a jaw spread greater than 8 inches, are restricted to water sets. Exemptions may be approved by the appropriate State Director on a case by case basis. Use of all rotating jaw (body grip) traps will comply with Federal, State, Tribal, or local laws or authorizing permits.

(1) Exemptions may be approved by the appropriate State Director on a case by case basis for using rotating jaw (body-grip, Conibear-type) traps on sets other than water sets when;

1. the trapping location is not accessible to humans by road or by foot.

n. the use of other trapping tools and techniques has proven to be ineffective, and the rotating jaw (body-grip, Conibear-type) trap has proven to be a safe and effective method to capture the species of concern.

111. must be in compliance with state and local ordinances and BMP's.

k. Cage Traps. Use and placement of cage traps by WS personnel will comply with applicable laws, regulations and authorizing permits. Cage traps loaned to cooperators or members of the public will be labeled as "Loaned Equipment." Cooperators will be responsible for replacing lost, damaged, or stolen equipment (WS Directive 4.165, Loaning Equipment).

1. Decoy Traps. Decoy traps utilize live animals, typically birds, maintained within the trap to serve as an incentive for additional animals to enter the trap. WS personnel will maintain adequate food, water, and perching area in such traps.

m. Trapper Education. All employees whose duties involve animal capture should participate in a WS approved trapper education course as recommended by Best Management Practices guidelines. State Directors may provide for continuing trapping education for appropriate employees at district, state, or regional meetings.

7. APPLICABILITY

This directive applies to all WS personnel acting in their official capacity.

8. REFERENCES

a. The Act of March 2, 1931 (7 USC 426-426b)
b. The Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988 (7 USC 426c)
c. 50 CFR Part 21 - Migratory Bird Permits, Subpart D - Control of Depredating Birds
d. 50 CFR Part 22 - Eagle Permits
e. Association of Fish and Wildlife Agencies, Best Management Practices for Trapping in the United States, http://fishwildlife.org/?section=best_management_practices
f. WS Directive 2.210, Compliance with Federal, State, and Local Laws and Regulations (10/27/2009)
g. WS Directive 2.455, Scents, Baits, and Attractants (2/17/04)
h. WS Directive 2.501, Translocation of Wildlife (7/30/03)
1. WS Directive 2.505, Lethal Control of Animals (5/18/2011)
J. WS Directive 2.510, Fur, Other Animal Parts, and Edible Meat (10/8/03)
k. WS Directive 2.515, Disposal of Wildlife Carcasses (5/18/2011)
1. WS Directive 4.165, Loaning Equipment (10/31/03)

William H. Clay

Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

Wildlife Services Directive

2.615
April 19, 2016

WS FIREARM USE AND SAFETY

1. PURPOSE

To establish guidelines for the use of firearms in the conduct of official duties and to prescribe standard training requirements.

2. REPLACEMENT HIGHLIGHTS

This directive revises WS Directive 2.615 dated 11/04/2009.

3. DEFINITIONS

Accident: An event which results in an injury or property damage.

Firearm: Any handgun, rifle or shotgun, regardless of ownership, which is used for official Government business or is transported or stored in a vehicle (defined below). This directive also covers pyrotechnics pistols, net guns, paint ball guns, dart guns, air rifles, arrow guns, and crossbows.

Incident: An event where no injury or property damage occurs.

Loaded Firearm: As defined by WS, a loaded firearm has a cartridge in the chamber.

Personnel: All persons employed by Wildlife Services (WS) or under the supervision of WS including State employees and official volunteers.

Shooting "Out of a Vehicle": Any shooting position in which the muzzle of the firearm is outside of and pointed in a safe direction away from the shooter's vehicle. The shooter may be inside the vehicle or in the cargo bed of trucks.

Suppressed firearms: Those firearms fitted with a removable or integral suppressor.

Suppressor: Those sound dampening devices requiring a permit from the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) (ATFF5 (5320.5)).

Vehicle: Any Government-owned, leased, or privately-owned vehicles leased or used for official Government business. This includes off highway vehicles and watercraft.

4. POLICY

Use of Firearms

Use and possession of firearms must be in accordance with federal, state, and local laws and regulations (see WS Directive 2.210).

WS personnel are authorized to store, transport, carry, and use firearms necessary to perform official WS duties.

In accordance with Section 5F Departmental Regulation 4200-00 ("Workplace Violence Prevention and Response Program"), while on official duty, employees are only authorized to carry firearms to be used for official WS operations.

WS personnel will adhere to all safety standards of firearm operation as described in the WS Firearms Safety Training Manual.

Shooting a firearm, projectile, or pyrotechnic out of a vehicle is permitted as long as the firearm or device is not loaded (a cartridge in the chamber) until the muzzle is safely out the window of the vehicle and a clear line of fire has been established. The muzzle of the firearm or device may not be retrieved back into the vehicle until the device has no live round in the chamber.

WS personnel who use firearms are subject to new applicant drug testing, random drug testing, reasonable suspicion testing, and post accident testing (accidents resulting in death, personal injury, or property damage over $10,000) as administered by the U.S. Department of Agriculture (MRP Drug Free Workplace Program Handbook).

All persons acting on behalf of WS who are required or requested to use firearms are subject to the Lautenburg Domestic Confiscation Law and are required to immediately inform their supervisor if they can no longer comply with the Lautenburg Domestic Confiscation Law.

Firearm security must be a top priority. Whether a firearm is being stored in an office, vehicle, home, camp, or any other location, the maximum level of security available should be employed. Security devices may range from gun safes, vaults, locking gun racks, to cables through the receiver or frame opening locked to an immovable object. Combinations or extra keys will not be stored in a way that gives unauthorized personnel access to firearms.

Firearms will not be left unattended unless stored in accordance with this Directive.

Firearms will not be stored in a vehicle overnight unless approved as follows: If it is determined that leaving firearms in a vehicle overnight is the most secure location, the State Director or NWRC Project/Unit Leader shall determine if additional measures are needed to best match the security level to the local risk. Additional measures may include ignition kill switches, vehicle alarms, or GPS tracking devices. Requests for authorization to leave firearms unattended in a vehicle at night must be submitted in writing by the State Director or NWRC Project/Unit Leader to the appropriate Regional Director or the Director of the National Wildlife Research Center (NWRC) for approval

Although not as sensitive as firearms, pyrotechnic pistols, net guns, paint ball guns, dart guns, air rifles, arrow guns, and crossbows will be stored unloaded in a locked, secured location as deemed appropriate by the State Director or NWRC Project/Unit Leader. Ammunition will be stored in a dry, locked, secure location as deemed appropriate by the State Director or NWRC Project/Unit Leader.

<u>Transportation and Storage of Firearms in Vehicles</u>
When firearms are needed for immediate use, vehicles will be equipped with a firearm rack or other device which securely holds the firearm and has been approved by the State Director or NWRC Project/Unit Leader. Window racks or open hard sided cases on the rear seat are not considered appropriate for use.

When firearms are not needed for immediate use or are left unattended at any time, they will be stored in locking gun racks, gun vaults, locking metal cabinets or boxes, or with a locking cable through the receiver or frame opening and locked to the seat frame or other immovable object. Gun vaults or other metal boxes should be bolted to the floor or otherwise securely attached to the vehicle. Combinations or extra keys will not be stored in a way that gives unauthorized personnel access to firearms. It should be noted that the potential for theft at any given location may vary greatly. State Directors and NWRC Project/Unit Leaders are in the best position to determine this potential and to determine the appropriate security measures required.

Firearms will not have a cartridge in the chamber while being transported in a motor vehicle except where standardized procedures and guidelines have been established by the WS program and the specific procedures and guidelines concerning such practices are fully implemented (e.g., Sharpshooting Procedures/Guidelines for White-Tailed Deer Damage Management). Semi-automatic rifles and shotguns will be carried in vehicles in one of two ways: 1) with the chamber and magazine empty and the bolt locked to the rear or 2) with ammunition stored in the magazine, but with a chamber safety flag or similar device used to prevent the bolt from closing completely and to serve as a visual aid to ensure the firearm does not have a live round in the chamber.

<u>Storage of Firearms in Government Facilities</u>
Firearms will be stored unloaded (no cartridges, shells, propellants, or projectiles in the chamber or magazine) and in a gun safe or vault. Personal firearms must be maintained in the same manner when stored in a government office or facility. Access to firearms stored in gun safes or vaults will be limited to the State Director, NWRC Project/Unit Leader, and/or their designee(s). Gun safes should be bolted to the floor or wall as deemed necessary by the State Director or NWRC Project/Unit Leader.

Storage of Firearms in the Home

Government-owned firearms are to be stored unloaded (no cartridge, shells, propellants, or projectiles in the chamber or magazine) in a gun safe, vault, or locking metal cabinet. A locking cable through the receiver or frame opening secured to immovable object thereby preventing theft and rendering the firearm inoperable may substitute for a gun safe, vault, or locking metal cabinet. Storing firearms inside a locked hard-sided gun case secured to an immovable object would also suffice. It is recommended that personal firearms be maintained in this manner when stored in the employee's residence.

Storage of Firearms while in Travel Status

Firearms will not be stored in a vehicle overnight unless approved as follows: Requests for authorization to leave firearms unattended in a vehicle overnight must be submitted in writing by the State Director or NWRC Project/Unit Leader to the appropriate Regional Director or the Director of the National Wildlife Research Center (NWRC) for approval. Firearms will be placed in a hard or soft sided gun case, removed from the vehicle, and locked in the employee's hotel room. If the firearm is left unattended at any time, a locking cable will be placed through the receiver or frame opening and secured to an immovable object (e.g., bed frame or plumbing fixture) thereby preventing theft and rendering the firearm inoperable. Firearms inside a locked hard-sided gun case secured to an immovable object would also suffice.

Firearm Inspection and Repairs

All firearms used by WS employees on the job will be inspected at least annually by the appropriate supervisor or designee to ensure serviceability and proper functioning of actions and safeties. All documentation of inspections will be retained in the appropriate State or NWRC office. It is recommended to document annual inspections using WS Form 82 (Field Inspection Report); however any documentation will suffice. Any repair work on government owned firearms will be conducted by a qualified gunsmith or other qualified individual as designated and approved by the State Director or NWRC Project/Unit Leader.

Reporting Incidents and Accidents

Incidents, accidents, or property damage resulting from the use of a firearm must be immediately reported to the appropriate supervisor who will report the incident to the WS Firearms Committee. The WS Firearms Committee is responsible for investigating and/or coordinating the investigation of any incident, accident, or property damage related to the use of a firearm, and reporting any findings and/or recommendations to the WS Management Team. It shall be the responsibility of the State Director or NWRC Project/Unit Leader, and/or appropriate Regional Director or Director of the National Wildlife Research Center to recommend any personnel actions as a result of the accident/incident.

Safety Information

Firearm safety posters or other visual safety information will be displayed on workplace bulletin boards, near storage areas, and in vehicles to reinforce safety awareness and to maintain a focus on safe practices. It shall be the responsibility of the State Directors and NWRC Project/Unit Leaders to disseminate Firearm Safety Bulletins to employees under their supervision.

5. TRAINING REQUIREMENTS

All WS personnel, regardless of employment status, and official volunteers who are required or requested to use firearms in the conduct of official duties, must adhere to all basic rules of firearms safety, and will be provided firearm safety and handling training as prescribed by the WS Firearms Safety Training Manual. To ensure WS employees receive uniform firearms safety training, National Rifle Association (NRA) certified instructors and the NRA's curriculum for the basic pistol, rifle, and shotgun certification is the only officially recognized program for initial WS firearms safety training. New WS employees will not use government or personal firearms in an official capacity until they have completed an NRA Firearm Safety Training course pursuant to the firearm(s) the employee will use on the job. Current WS employees may continue to use firearms and will receive updated training as per the WS Firearms Safety Training Manual.

State Directors and NWRC Project/Unit Leaders are responsible for ensuring that employees receive firearms safety and handling instruction as prescribed in the WS Firearms Safety Training Manual. Initial training must be documented using the NRA's Certification of Training or similar training form. Certificates will be maintained in the employee's personnel file. Subsequent training as outlined in the WS Firearms Safety Training Manual will also be documented by State Directors and NWRC Project/Unit Leaders.

Aerial crewmember training will consist of instruction from the WS Firearm Safety Training Manual as well as other additional specialized instruction that may be contained in the WS Aviation Operations Manual, the WS Aviation Safety Program Manual, and the WS Aerial Operation Crew Member Training Manual.

6. REFERENCES

MRP Drug Free Workplace Program Handbook, MRP 4792.1 (March 2009).
Lautenberg Domestic Confiscation Law (18 U.S.C. 922).
WS Firearms Safety Training Manual.
WS Aviation Operations Manual (04/09/01).
WS Aerial Operations Crew Member Training Manual.
WS Aviation Safety Program Manual.
http://www.ocio.usda.gov/document/departmental-regulation-4200-001

William H. Clay
Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.625 01/06/06

PYROTECHNICS, ROCKET NET CHARGES, AND INCIDENTAL EXPLOSIVE MATERIALS

1. PURPOSE

To establish procedures and accountability for the safe, secure handling and use of explosive pest control devices (pyrotechnics), rocket net charges, and other incidental explosive materials for WS employees, and to ensure that applicable laws, regulations, and policies are observed. This directive is not intended to provide procedures and accountability for explosives used for removing beaver dams.

11. REPLACEMENT HIGHLIGHTS

This is a new directive.

12. BACKGROUND

Pest control pyrotechnics are an effective, non-lethal wildlife damage management tool for dispersing wild animals when they damage agriculture, property, or threaten public safety or health. Rocket nets provide a means for the live capture of birds and other wildlife for both management and research purposes. Pyrotechnics and rocket net charges contain regulated explosive materials requiring specific safety, security, storage, transportation, and records maintenance procedures. Incidental components of wildlife damage management tools which are classified as explosive materials include electric matches used to initiate cannon net charges and gas cartridge fuses.

Procedures and accountability for explosives used for removing beaver dams and associated training/certification requirements are detailed in WS Directive 2.435.

4. POLICY

WS personnel are authorized to use commercially available explosives covered by this directive that are approved for distribution and use by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) on official WS projects as directed by their State Director or NWRC Field Station Leader. These explosive materials will be stored and transported in accordance with the procedures provided in the Standard for Storage and Transportation of Pyrotechnics, Rocket Net Charges, and Incidental Explosive Materials (Attachment 1).

All WS use, storage, and transportation of explosives will be in compliance with applicable Federal, State, and local laws and regulations.

Employees assigned to use pyrotechnic pistols or other launching devices will receive safety training in their use as required by WS Directive 2.615, WS Firearms Use and Safety.

Pyrotechnics will only be used by employees wearing appropriate personal protective equipment, i.e., hearing and eye protection as identified in the State/NWRC Field Station or District program's job hazard assessment for pyrotechnic use (See APHIS Safety and Health Manual (6/30/04), Chapter 11, Section 1, Personal Protective Equipment).

WS offices and personnel will provide information on the safe use of pyrotechnics and their launching devices to private individuals, outside organizations and agencies, and business to whom WS distributes or recommends pyrotechnics for wildlife conflict resolution, e.g., OSHA/WS "Quick Card" information card. Rocket net charges will not be loaned or otherwise distributed outside of WS with the exception of State and other Federal wildlife management agencies.

Accountability for hazardous materials subject to this directive will be in accordance with the Standard for Storage and Transportation of Pyrotechnics, Rocket Net Charges, and Incidental Explosive Materials (Attachment 1).

5. REFERENCES

Title 27, Code of Federal Regulations, Part 555, Commerce in Explosives.
Federal Explosives Law and Regulations, ATF P 5400.7.
Title 29, Code of Federal Regulations, Part 1910.109, Explosives and Blasting Agents.
Title 29, Code of Federal Regulations, Part 1910, Subpart I, Personal Protective Equipment.
Title 49, Code of Federal Regulations, Part 173, Shippers-General Requirements for Shipments and Packaging.
Title 49, Code of Federal Regulations, Part 177, Carriage by Public Highway.
APHIS Safety and Health Manual (Revised 6/30/04).
WS Directive 2.615, Firearms Use and Safety (01/06/06).
WS Directive 2.435, Explosives Use and Safety (01/06/06).
WS Standard Operating Procedures for Rocket and Cannon Net Use.
WS Explosives Safety Manual.
Institute of Makers of Explosives Safety Library Publication No. 22.

Deputy Administrator

Attachment 1
01/06/06

STANDARD FOR STORAGE AND TRANSPORTATION OF PYROTECHNICS, ROCKET NET CHARGES AND INCIDENTAL EXPLOSIVE MATERIALS

WILDLIFE SERVICES

This standard applies to the storage, transportation, and use by Wildlife Services (WS) personnel of pyrotechnics, rocket net charges, electric matches used to initiate cannon net charges, and gas cartridge fuses. The standard is based on Federal laws and regulations pertaining to explosive materials, Federal and industry standards for explosives safety and security, and applicable Agency directives. The requirements and rules that follow will help WS ensure safe, secure, and legally compliant storage and transportation for the explosive materials covered by these procedures. A variance request can be made through OSS for special or unusual circumstances.

I. PYROTECHNICS

Pyrotechnics authorized for storage, transportation, and use by WS personnel are restricted to commercially available "explosive pest control devices" classified by the U.S. Department of Transportation (DOT) as Division 1.4 explosives and approved as legal explosive devices by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). Division 1.4 explosives are those packaged and shipped to prevent mass detonation of container contents. Approved pyrotechnics packaged as Division 1.4 include the 15mm bird banger and screamer siren cartridges, 12 gauge shell crackers, 18.2mm CAPA long-range cartridges, and rope firecrackers commonly used by WS.

9. **Overnight Storage**

Rule 1: Never store pyrotechnics or any other explosive material in a residence.

Rule 2: All pyrotechnics will be stored in accordance with Rule 3 to comply with ATF regulations (Federal Explosives Law and Regulations, ATF P 5400.7) and OSHA regulations (29 CFR 1910.109) or in accordance with the temporary overnight vehicle storage variance cited below.

Rule 3: Magazines approved for overnight storage of pyrotechnics will meet one of the following descriptions:

a. An outdoor magazine meeting ATF Type 1 magazine standards (Federal Explosives Law and Regulations, ATF 5400.7, Subpart K, 55.207) or ATF Type 2 outdoor magazine standards (ATF 5400.7, Subpart K, 55.208(a) (http://www.atf.gov/pub/fire-explo_pub/explo_law_reg.htm). Type 2 outdoor magazines will be of substantial size and construction to discourage theft, have metal floors, and be securely anchored to a concrete slab or to substantial ground anchors.

b. An indoor magazine that meets ATF Type 2 or ATF Type 4 indoor magazine standards. See ATF 5400.7, Subpart K, 55.208(b) and 55.210 for construction and lock requirements (http://www.atf.gov/pub/fire-explo_pub/explo_law_reg.htm). The IME-22 container (IME Safety Library Publication No. 22, Part 2, paragraph B and Appendix C; http://www.ime.org/imestore/default.asp) exceeds these standards and can be used as an indoor storage magazine for Division 1.4 pyrotechnics. Indoor magazines must be locked and kept in a locked building in accordance with ATF 5400.7, Subpart K (http://www.atf.gov/pub/fire-explo_pub/explo_law_reg.htm). Indoor magazines must be painted red and have in 3” high white lettering “EXPLOSIVES – KEEP FIRE AWAY” on the front, top, and all sides. Each indoor magazine must be provided with substantial wheels or casters (unattached, flat 4-wheel furniture-type dollies are recommended).

Rule 4: Pyrotechnics will be stored in a magazine containing no other commodities or materials except for gas cartridge fuses and/or boxed small arms ammunition. Pyrotechnics will not be stored in the same magazine with rocket net charges or explosives used for removing beaver dams (detonators, binary explosives, detonating cord, safety fuse, and pull wire igniters). Pyrotechnics will be maintained in the manufacturer’s small cardboard boxes when not in use rather than stored loose or in plastic bags.

Rule 5: The quantity of any explosive materials stored in an indoor magazine must not exceed 50 lbs. per magazine or 50 lbs. per building when explosive materials are stored in more than one indoor magazine in the same building.

For example, the average weight of the total pyrotechnic composition in 15mm bird banger and screamer siren cartridges is 4 grams per cartridge. Therefore, the maximum number of 15 mm bird banger and/or screamer siren cartridges that can be stored in a single indoor magazine or building is 5,600 cartridges as long as no other explosive materials are present. The average explosives weight for cracker shells is 2 grams per cartridge; therefore, 11,000 cracker shells equal 50 pounds of explosive material. Since CAPA long-range cartridges (18.2mm) contain an average total explosives weight of 5.73 grams, a total of 3,900 CAPA cartridges contain 50 pounds of explosive material. Any combination of pyrotechnic devices containing a total of not more than 50 pounds of explosive material can be stored together in a single magazine, or when multiple magazines are used, in a single building.

The storage of up to 300,000 pounds of explosive material is permitted in ATF Type 1 or Type 2 outdoor magazines. The American Table of Distances for Storage of Explosives (ATF 5400.7, Subpart K, 55.218) applies to explosive materials stored in outdoor magazines. This table provides mandatory separation distances between explosives magazines and inhabited buildings, public highways, and railways.

Rule 6: Smoking, matches, open flame, or spark producing devices are not permitted within 50 feet of explosives magazines. Persons approaching magazines must be warned verbally or by warning signs posted at appropriate locations. Combustible materials and flammable liquids will not be stored within 50 feet of magazines. The land surrounding a magazine will be kept clear of all combustible materials for a distance of at least 25 feet.

Rule 7: The appropriate Material Safety Data Sheet(s) (MSDS) will be kept with the magazine.

Rule 8: Each magazine, their contents, and required inventory records will be in the charge of a designated employee who is in charge of enforcing safety precautions, security, inspections, and inventory records and reporting requirements.

Rule 9: Access to explosive materials by unauthorized persons will be restricted by keeping magazines locked when not adding or withdrawing explosive materials from them and by providing proper security to magazine keys.

B. Temporary Overnight Vehicle Storage

When necessary, pyrotechnics and their launch components may be stored overnight in a locked vehicle under the following conditions:

Rule 1: Overnight storage of pyrotechnics in a vehicle is authorized only when they are "in use" on an assigned project, and it is not practical to return them to magazine storage as described above in section A. Overnight Storage. "In use" on an assigned project is defined as the period of time between the date a field project is initiated until its completion date not to exceed 14 consecutive days and nights. State Directors and NWRC Field Station Leaders are authorized to extend overnight vehicle storage beyond 14 days on a case-by-case basis when necessary to meet program objectives. Permanent overnight storage of pyrotechnics in a vehicle is prohibited.

Rule 2: No more pyrotechnic cartridges than necessary to complete an assigned project may be stored overnight per vehicle, and in no case will more than 2,000 cartridges per vehicle be stored in the manner prescribed in this section.

Rule 3: Pyrotechnics temporarily stored in this manner will be locked inside an unmarked (for security reasons) IME-22 or other secure container containing no metal objects, explosive detonators, pesticides, I&E drugs or other chemicals. At a minimum, this container will consist of a metal exterior and an interior surface of non-sparking material. No screw heads or other metal surfaces will be exposed in the interior. The container lid must overlap the sides by at least 1 inch. For overnight vehicle storage, pyrotechnics must be: 1) stored in a locked container as described above under this rule which is placed out of sight inside a locked vehicle, affixed camper shell, or truck box, or 2) in a locked, unmarked IME 22 container securely affixed to the bed of a truck.

C. Transportation

Rule 1: During transportation over public roadways, pyrotechnics will be locked in a secure container as described above under B.

Temporary Overnight Vehicle Storage, Rule 3. Transportation of bulk quantities of pyrotechnics in IME-22 containers (e.g., from a central magazine to smaller outlying magazines) is permitted. IME-22 containers will be permanently or temporarily secured to the vehicle during transit to prevent theft or a safety hazard in the event of an accident and be covered by a tarpaulin or other waterproof covering during inclement weather.

Rule 2: Metal objects, explosive detonators, pesticides, I&E drugs, and other chemicals will not be carried in the same container with pyrotechnics.

Rule 3: Each vehicle used to transport pyrotechnics or rocket net charges will be equipped with a fire extinguisher having a rating of at least 3-A:40-B:C. Vehicles transporting bulk shipments (5,000 or more cartridges) of pyrotechnics will carry two such fire extinguishers.

II. ROCKET NET CHARGES AND ELECTRIC MATCHES

Rocket net charges present a greater hazard than Division 1.4 explosives and are classified as high explosives by ATF and Division 1.3 explosives by DOT. They will be stored in a locked ATF Type 1 or ATF Type 2 magazine (Federal Explosives Law and Regulations, ATF 5400.7, Subpart K, 55.207 and 55.208) that contains no other explosive material or other commodities except that shunted electric matches (used to initiate cannon net charges) may be stored in the same magazine with rocket net charges. Rocket net charges will be stored with their leg wires shunted (exposed wire ends twisted together or held together with manufacturers shunt device). Indoor Type 2 magazines will be secured in a locked building other than a residence. The IME-22 container (IME Safety Library Publication No. 22, Part 2, paragraph B and Appendix C; http://www.ime.org/imestore/default.asp) meets ATF Type 2 indoor magazine standard. All overnight storage rules for pyrotechnics cited above under I. PYROTECHNICS, A. Overnight Storage apply to the storage of rocket net charges.

Temporary overnight vehicle storage of “in use” rocket net charges is authorized in accordance with the same provisions outlined above under I. PYROTECHNICS, B. Temporary Overnight Vehicle Storage, except rocket net charges temporarily stored overnight in a vehicle must be kept in an unmarked IME-22 container temporarily or permanently secured to the vehicle. Only the number of rocket net charges needed for the immediate project(s) will be temporarily stored in a vehicle.

Transportation of rocket net charges will be in an IME-22 container containing no metal objects, explosive detonators, pesticides, I&E drugs or other chemicals. IME-22 containers must be permanently or temporarily secured to the vehicle during transit and covered by a tarpaulin or other waterproof covering during inclement weather.

Electric matches used to initiate cannon net charges are classified as Division 1.4 explosives and will be stored and transported either: 1) in the magazine and IME-22 container described above for rocket net charges (separately or together), or 2) stored in a Type 2 or Type 4 magazine and transported in a metal container as described above under B. Temporary Overnight Vehicle Storage, Rule 3.

Two-way radios and cellular telephones can be a safety hazard around explosive materials sensitive to electrical initiation. Cell phones should be turned off when present around rocket net charges and/or electric matches. While setting up rocket and cannon nets, cell phones and radios will be turned off and left in the equipment transport vehicle.

Smokeless powder designed for small arms ammunition and used to propel cannon nets is exempt from regulation (27 CFR 555). WS personnel will store and transport smokeless powder in a separate, locked container.

III. GAS CARTRIDGE FUSES

Gas cartridge fuses can be stored and transported with gas cartridges in containers approved for hazardous chemicals as described in WS Directive 2.401, Pesticide Use. When stored separate from the gas cartridges, fuses will be kept in a locked metal container with a non-sparking lining (e.g., wood, foam rubber, latex paint). Fuses will remain sealed in a plastic bag during storage and transportation. Gas cartridges will not be stored in an explosives magazine.

IV. RECORD KEEPING AND REPORTING

Inventory and purchase records for pyrotechnics, rocket net charges, electric matches, and gas cartridges (track gas cartridge numbers rather than fuse under the premise that each cartridge has one fuse) will be maintained at the State Office/NWRC Field Station level for a minimum of 5 years unless State or local authorities require a longer retention period. These records are subject to examination by ATF and periodic internal review to ensure accountability, completeness, and accuracy.

A running inventory of pyrotechnics, rocket net charges, and electric matches for all locations where these explosive materials are stored will be maintained by the designated employee at each magazine location. A quarterly physical inventory will be conducted and recorded in the Control Materials Inventory Tracking System (CMITS) in accordance with WS Directive 2.465. Inventory information will include the number of pyrotechnics, rocket net charges, and/or electric matches received from the distributor, date of manufacture (date code information on package if provided), the number removed, used, destroyed, and returned to the magazine or transferred to another WS location.

Gas cartridge fuses will be tracked on CMITS through their association with the cartridges themselves and need not be a separate reporting category.

V. MAGAZINE INSPECTIONS

Each magazine site where explosive materials are stored will be inspected at least every 7 days. This weekly inspection need not be an inventory, but must be sufficient to determine whether unauthorized entry or theft of explosive materials has occurred. Safety inspections of explosives magazine sites will be conducted and documented a minimum of twice annually on APHIS Form 256-5, APHIS Safety Inspection Checklist (http://www.aphis.usda.gov/mrpbs/forms/aphis/aphis256-5.pdf) for explosive materials stored in magazines located at government owned and leased facilities and on WS Form 39, WS Self-Inspection Checklist - Residential Storage Sites for Pesticides, Pyrotechnics, Rocket Net Charges, and/or Incidental Explosive Materials, for magazines stored at an employee’s place of residence. Upon completion, inspection forms will be forwarded to the State program or NWRC Field Station designated official.

VI. THEFT OR LOSS

Any WS employee with knowledge of the theft or loss of explosive material will immediately notify their supervisor. As soon as possible, and within 24 hours of discovery, the theft or loss must be reported to ATF by telephoning 1-888-283-2662 (nationwide toll free number). ATF Form 5400.5 will be immediately completed and mailed or faxed to the nearest ATF office along with any invoices and additional information (ATF: Explosives Law and Regulations, ATF P 5400.7, Subpart C, 55.30).

Additionally, any suspicious or unusual activity, theft or attempted theft of explosive materials as well as break-ins or attempted break-ins to buildings where explosive materials are stored will be reported in a timely manner to State and local law enforcement authorities, the State Director, and the WS Explosives Safety Committee through the Committee Chair (301-734-7921).

APPENDIX C

Summaries of Recovery Plan Narratives Relating to Predator Damage Management

1. Western Snowy Plover Pacific Coast Population Final Recovery Plan (USFWS 2007): The Recovery Plan calls for preventing excessive predation on snowy plovers. Land managers should employ an integrated approach to predator management that considers a full range of management techniques. In addition to predator management activities by on-site biologists, assistance from the U.S. Department of Agriculture (Wildlife Services Branch) biologists, State wildlife agency furbearer biologists, biologists specializing in avian predators, and professional trappers should be sought and used as needed and appropriate. Federal, State, and local agencies and the general public should be cognizant of the adverse consequences to listed species if needed predator control measure are prohibited or restricted.

2. Salt Marsh Harvest Mouse & California Clapper Rail Recovery Plan (USFWS 1984). This Recovery plan does not specifically discuss predator damage management as a recovery action, but rather lists and describes securing habitat as a major objective. The San Francisco Bay National Wildlife Refuge Predator Management Plan and Final Environmental Assessment (USFWS 1991) discusses predation as a major threat to the survival of the California clapper rail. The EA states that although habitat acquisition and restoration continue to be a primary objective, without predator management, clapper rail density goals will not be met, and the population as a whole will continue its downward trend

3. Recovery Plan for the Marbled Murrelet (USDI 1997). The Recovery Plan cites predation as a major cause of nest failures, actions to stabilize and increase the population that include decreasing adult and juvenile mortality, reducing nest predation, and increasing recruitment.

4. Light-Footed Clapper Rail Recovery Plan (USFWS 1979). The Recovery Plan calls for minimizing effects of predation as one of an important aspect of recovery. In certain marshes predation is thought to be a significant problem; the extent of predation (especially by pets or feral animals) must be determined to reduce the potential impact on rail populations. Once the predators have been identified appropriate control measures may be instituted such as trapping, construction of electric fences or water barriers, etc.

5. Revised California Least Tern Recovery Plan (USFWS 1985). The Recovery Plan cites predation of adult terns, eggs, or young and prevention of colony abandonment may be attempted by judiciously monitoring colonies to detect potential or actual predation problems. Control of problem predators by trapping, shooting, use of electric fences, and other means is required and has been successful at increasing tern nesting and reproductive success. Emergency procedures may need to be implemented to maximize tern survival and reproduction.

RESTRICTED USE PESTICIDE

Due to High Acute Inhalation Toxicity and Eye and Skin Corrosiveness to Humans; High Acute Toxicity to Nontarget Birds and Aquatic Invertebrates; and the Need for Highly Specialized Applicator Training.

For retail sale to and use only by USDA APHIS Certified Applicators trained in bird control or by persons under their direct supervision.

COMPOUND DRC-1339 CONCENTRATE – LIVESTOCK, NEST & FODDER DEPREDATIONS

For control of crows, ravens, and magpies that prey on newborn livestock, that prey on eggs or the young of Federally-designated Threatened or Endangered Species or of other species designated to be in need of special protection or that damage and feed on the contents of silage/fodder bags.

ACTIVE INGREDIENT:
DRC-1339, 3-chloro-p-toluidine hydrochloride:............. 97.0%
OTHER INGREDIENTS:.. 3.0%
TOTAL:...100.0%

KEEP OUT OF REACH OF CHILDREN

DANGER-PELIGRO
POISON

FIRST AID

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. If you need immediate medical attention call the Poison Control Center at 1-800-222-1222 or a doctor. For non-emergency information concerning this product, call the National Pesticide Information Center at 1-800-858-7378.

If swallowed	- Call a poison control center or doctor immediately for treatment advice. - Have person sip a glass of water if able to swallow. - Do not induce vomiting unless told to do so by the poison control center or doctor. - Do not give anything to an unconscious person.
If on skin or clothing	- Take off contaminated clothing. - Rinse skin immediately with plenty of water for 15-20 minutes. - Call a poison control center or doctor immediately for treatment advice
If inhaled	- Move person to fresh air. - If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. - Call a poison control center or doctor immediately for treatment advice.
If in eyes	- Hold eye open and rinse slowly and gently with water for 15-20 minutes. - Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. - Call a poison control center or doctor immediately for treatment advice.

NOTE TO PHYSICIAN AND VETERINARIAN: Probable mucosal damage may contraindicate the use of gastric lavage. See additional "**PRECAUTIONARY STATEMENTS**" on right panel. If pet eats bait, call a veterinarian at once.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

Acute Hazards: Fatal if inhaled. Corrosive. Causes irreversible eye damage and skin burns. May be fatal if swallowed. Harmful if absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some people.

Hazard Avoidance: Do not get in eyes, on skin, or on clothing. Do not breathe dust. Wear protective clothing, eyewear, and respiratory protection as listed under "**PERSONAL PROTECTIVE EQUIPMENT.**" Wash thoroughly with soap and water after handling and before eating or smoking. Remove contaminated clothing and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Handlers who mix packages containing 1 lb (0.45 kg) or more of this product must wear:
- Coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves (such as waterproof or rubber gloves)
- Chemical-resistant footwear plus socks
- Protective eyewear (goggles or face shield)
- A NIOSH approved particulate respirator with any N, R, or P filter with NIOSH approval number prefix TC-84A

Handlers who mix packages containing less than 1 lb (0.45 kg) of this product must wear:
- Long-sleeved shirt and long pants
- Chemical-resistant gloves (such as waterproof or rubber gloves)
- Protective eyewear (goggles or face shield)

Applicators who handle bait must wear:
- Long-sleeved shirt and long pants
- Chemical-resistant gloves (such as waterproof or rubber gloves)

User Safety Requirements:
- Follow manufacturer's instructions for cleaning/ maintaining PPE. If no such instructions are provided for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS:

This product is very highly toxic to birds and aquatic invertebrates. **Do not** use in any manner that may endanger nontarget and protected bird species. Runoff may be hazardous to aquatic organisms in neighboring areas. **Do not** apply when runoff is likely to occur. **Do not** apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. **Do not** contaminate water by the cleaning of equipment or disposal of waste.

ANIMAL AND PLANT HEALTH INSPECTION SERVICE
4700 River Road, Unit 149
Riverdale, MD 20737

EPA Reg. No. 56228-29
California Reg. No 56228-29-AA
EPA Est. No. 56228-ID-1
Net Contents: ______
Batch Code No.: ____________

Registration No. 56228-29, Page 1 of 3

ENDANGERED SPECIES CONSIDERATIONS:

Before undertaking any control operations with the product, consult with local, State, and Federal Wildlife authorities to ensure the use of this product presents no hazard to any Threatened or Endangered Species. **DO NOT** apply treated baits where there is a danger that Threatened or Endangered Species will consume baits unless special precautions are taken to limit such exposures.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ THIS LABEL:
Read the entire label. This product must be used strictly in accordance with this label's precautionary statements and use directions, as well as with all applicable State and Federal laws and regulations.

Before using this product, contact the U.S. Fish and Wildlife Service and the applicable State wildlife agency and obtain all necessary kill or collecting permits. Use only for the sites, pests, and application methods described on this label.

PRODUCT INFORMATION:

This product contains a slow-acting avicide which kills target bird species (see list below) in 1 to 3 days. As many types of nontarget birds are potentially vulnerable to DRC-1339, it is necessary to use care and to follow the requirements of this label to minimize impacts to nontarget species.

USE RESTRICTIONS:

Baits made from Compound DRC-1339 - Livestock, Nest & Fodder Depredations may only be used to control the following species:

- Common raven *(Corvus corax)*,
- Chihuahuan raven *(Corvus cryptoleucus)*,
- American crow *(Corvus brachyrhynchos)*,
- Black-billed magpie *(Pica hudsonia)*, and
- Fish crow *(Corvus ossifragus)*.

This product may be used to prepare egg or meat-cube baits to control the target species listed above in the following use sites:

- Rangeland and pastureland areas where ravens or crows prey upon newborn livestock;
- Refuges or other areas where ravens or crows prey upon the eggs and/or young of Federally-designated Threatened or Endangered Species, or upon the eggs and young of other species which Federal or State wildlife agencies have determined to be in need of protection from nest predators due to documented declines in numbers and/or in nesting success; or
- Within 25 feet (7.6 m) of silage/fodder bags that have been damaged or are likely to be damaged by crows, ravens, or black-billed magpies.

Baits must be prepared and applied as specified on this label. DO NOT apply baits made from this product by air or by use of any mechanical equipment designed to broadcast baits or other pesticides. Users of this product must follow all limitations indicated on this label regarding the placement and monitoring of treated baits.

Before baits made from this product are applied, sites that are to be treated **must be observed** for evidence of nontarget activity **and must be prebaited** (see specific instructions for these activities). **DO NOT** apply treated baits where there is a danger that Threatened or Endangered Species will consume baits unless special precautions are taken to limit such exposures. Such precautions shall include observation of baited sites and use of hazing tactics to frighten away Threatened or Endangered Species that otherwise might feed upon baits.

DIRECTIONS FOR USE, continued

USE RESTRICTIONS, continued:

DO NOT apply treated baits within 50 feet (15.2 m) of permanent manmade or natural bodies of water, unless baited sites are under constant observation while baits are exposed.

DO NOT exceed a maximum application rate of 0.083 lbs of active ingredient per acre (0.93 g active ingredient/100 m^2), or a maximum yearly application rate of 0.5 lb of active ingredient per acre (5.61 g active ingredient/100 m^2).

DO NOT store treated bait in locations accessible to children, pets, domestic animals, or nontarget wildlife.

Prior to application, and during the time between the conclusion of application and the disposal of unconsumed bait, **DO NOT** temporarily place treated bait in locations accessible to children, pets, domestic animals, or nontarget wildlife. Follow the directions in "**ENTRY RESTRICTIONS**" to avoid exposure to children, pets, or domestic animals during application. Follow the directions in "**PRETREATMENT OBSERVATIONS**" to mitigate exposure to nontarget wildlife during application.

DO NOT apply bait in a way that will contact workers or other persons.

DO NOT use treated baits as food or feed.

DO NOT apply baits made from this product in any way that could contaminate human food or animal feed.

ENTRY RESTRICTIONS:

Only protected applicators may be in the area during bait application. Keep pets and livestock, and persons other than authorized handlers away from the bait at all times, and exclude all unauthorized persons from application sites during prebaiting and baiting. For example, post signage near, in the vicinity of, or at main entrances or commonly used access points to prebaiting and baiting sites that warns persons not to pick up or handle any baits and to keep pets and livestock away from bait.

PRETREATMENT OBSERVATIONS:

Prior to application, carefully observe target birds' feeding habits to locate their preferred feeding sites, determine the optimum time of application, and evaluate potential hazards of the application to nontarget and protected species.

PREBAITING:

Prebaiting with untreated bait materials (or use of a draw station) is necessary to promote feeding by target species and to assess potential for exposure of nontarget species. Apply prebait using the same procedures that are prescribed below for the type of bait ("**EGG BAITS**" or "**MEAT BAITS**") that is to be used for toxic baiting.

Observe baited areas (from blinds) early in prebaiting period to determine whether nontarget species are approaching baits. Haze away Threatened or Endangered and nontarget species that might consume baits. Remove baits if such nontarget species continue to approach them.

(See next page for additional "DIRECTIONS FOR USE")

DIRECTIONS FOR USE, continued

BAIT PREPARATION:

MEAT BAITS:

MEAT BAIT PREPARATION:
Mix 0.027 oz (0.75 g) of this product with 0.18 oz (5.0 g) of powdered sugar.
Pour or sprinkle concentrate-sugar mixture over 200 meat cubes that measure about 0.5 in (1.3 cm) on each side.
Mix or tumble bait slowly until all meat cubes appear to be evenly covered.

MEAT BAIT APPLICATION:

NOTE: During application, wear all PPE as listed under "PERSONAL PROTECTIVE EQUIPMENT."

Control of crows, magpies, and ravens with meat baits prepared from this product is limited to the sites indicated above under "**USE RESTRICTIONS.**" Wear rubber gloves while handling baits. Place no more than 75 meat cube baits at each baited site. Place 5 to 10 baits in clusters over an area not to exceed 1,000 ft^2 (93 m^2) where control of ravens, magpies, and/or crows is to be affected. **Draw stations** (fresh, unpoisoned animal carcasses) may be needed to attract ravens, magpies, and/or crows to the locations selected for bait exposure. If draw stations are used, place meat baits on or within a few feet of the animal carcasses.

WHILE TREATED MEAT BAITS ARE EXPOSED, BAITED AREAS MUST BE OBSERVED CONTINUOUSLY FROM A DISTANCE OF NO MORE THAN 1,000 YARDS (914 m) TO DETECT APPROACHES BY THREATENED OR ENDANGERED SPECIES AND OTHER NONTARGET OR PROTECTED ANIMALS LIKELY TO EAT BAITS. Because of wariness of target bird species, it may be necessary to observe baits from behind natural or specially-constructed blinds. Haze away Threatened or Endangered and nontarget species that might consume baits. Remove baits if such nontarget species continue to approach them.

Unconsumed bait cubes must be retrieved daily, at the conclusion of each observation period and no later than one hour after sunset. Dispose of retrieved baits in accordance with applicable State and Federal laws.

EGG BAITS:

EGG BAIT PREPARATION:

Dissolve 0.07 oz (2 g) of the product in 0.2 pint (100 ml) of warm potable water at 110 °F (43.3 °C) to make an approximately 2% solution; or dissolve 0.14 oz (4 g) of the product in 0.2 pint (100 ml) of warm potable water at 110 °F (43.3 °C) to make an approximately 4% solution; or in other proportions to produce a 2% or 4% solution.

Using an 18-gauge hypodermic needle or similarly-sized implement. make an entry hole in the end of each hard-boiled chicken, turkey, or duck egg to be used. Using a syringe and a 20-gauge hypodermic needle, slowly inject 0.002 pints (1 ml) of the 2% solution (or 0.001 pints or 0.5 ml of the 4% solution) into the yolk of each egg.

Make only enough solution to treat the desired number of eggs. Mark treated eggs with small skull and crossbones or the word POISON.

DIRECTIONS FOR USE, continued

EGG BAIT APPLICATION:

NOTE: During application, wear all PPE as listed under "PERSONAL PROTECTIVE EQUIPMENT."

Control of crows, magpies, and ravens with egg baits prepared from this product is limited to the sites indicated above under "**USE RESTRICTIONS**". Place all egg baits to be used at one baited site within 25 ft (7.6 m) of the center of the site or within 25 ft (7.6 m) of any silage/fodder bags that are to be protected. Place 1-4 eggs in each bait set, and do not use more than a total of 18 eggs per baited site. If a draw station (fresh, unpoisoned animal carcass) is used, all bait sets must be located at least 10 ft (3 m) from the carcass. Wherever practical, bait sets should be made in "dummy" nests created by making small depressions in the ground. Dummy nests may be partially hidden by vegetation or other debris. In other situations, eggs may be placed on elevated wooden platforms 1 to 2 ft^2 (0.1 to 0.2 m^2) in area. Eggs placed on platforms must be restrained by wire to prevent them from falling off platforms or being removed by birds. Apply 2-3 eggs per platform.

DO NOT USE MORE EGGS THAN ARE NEEDED TO EFFECT CONTROL, as ravens and crows tend to cache surplus food.

Observe baited areas (from blinds) early in baiting period to determine whether nontarget species are approaching egg baits. Haze away Threatened or Endangered and nontarget species that might consume baits. Remove baits if such nontarget species continue to approach them.

Rebait with additional treated eggs when more than 50% of the treated eggs offered have been removed by ravens, magpies, or crows. When replacing baits, take care not to frighten target birds actively removing or feeding upon eggs. Retrieve unconsumed treated eggs within 7 days of exposure. Old treated eggs and treated eggs not eaten by the time control operations cease must be disposed of in accordance with applicable State and Federal laws.

POSTTREATMENT CLEAN-UP (Meat and Egg Baits):

NOTE: During clean-up, wear long-sleeved shirt and long pants and chemical-resistant gloves (such as waterproof or rubber gloves). To further reduce the potential for exposure, use appropriate implements such as scoops or other tools to collect carcasses or uneaten bait.

Collect unconsumed and leftover meat daily, and unconsumed and leftover egg baits, dying birds, and carcasses within 7 days of treatment. Dispose of such baits and carcasses by burning or burial, as authorized by applicable laws and ordinances.

STORAGE AND DISPOSAL

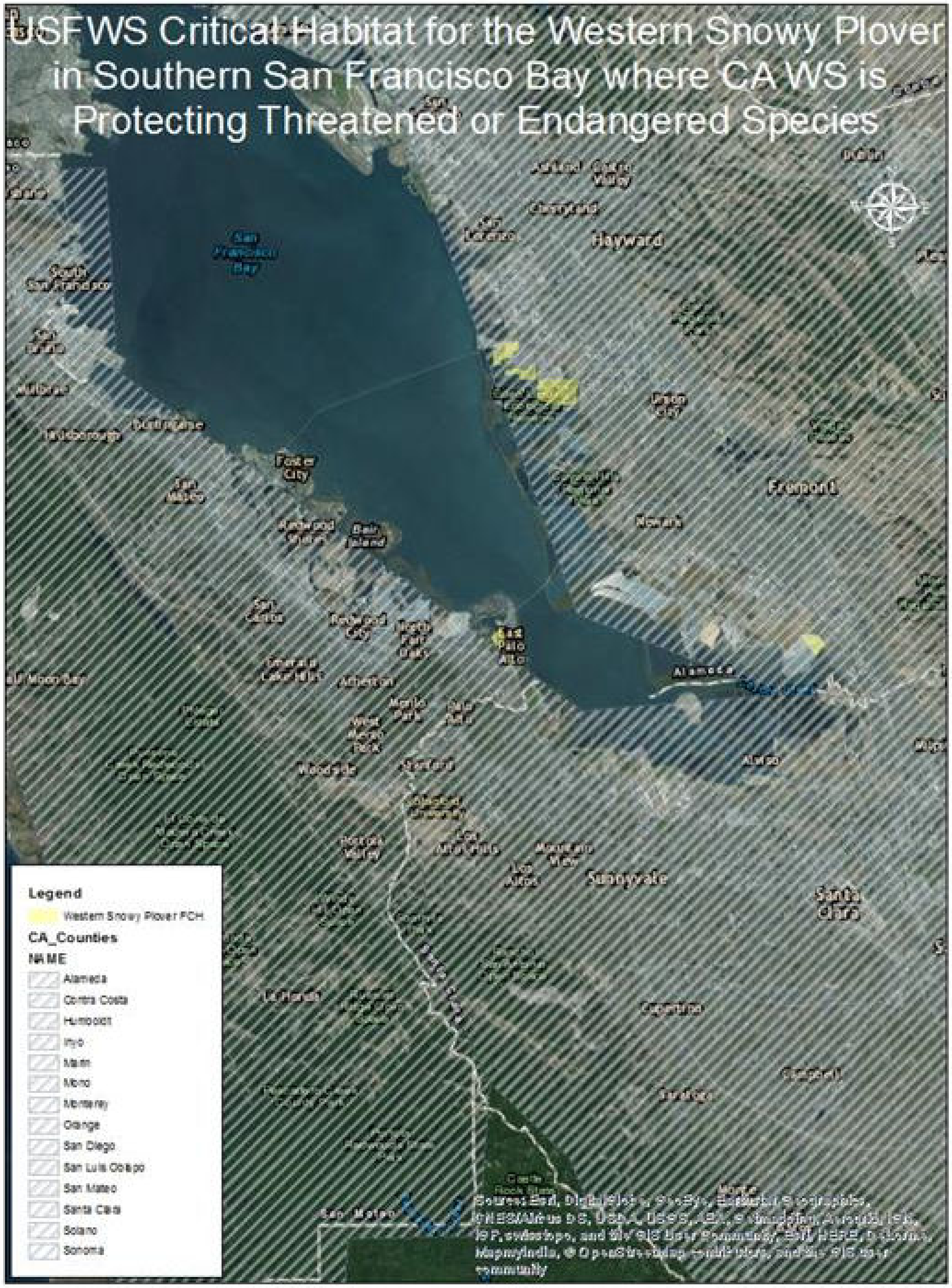
Do not contaminate water, food, or feed by storage or disposal.

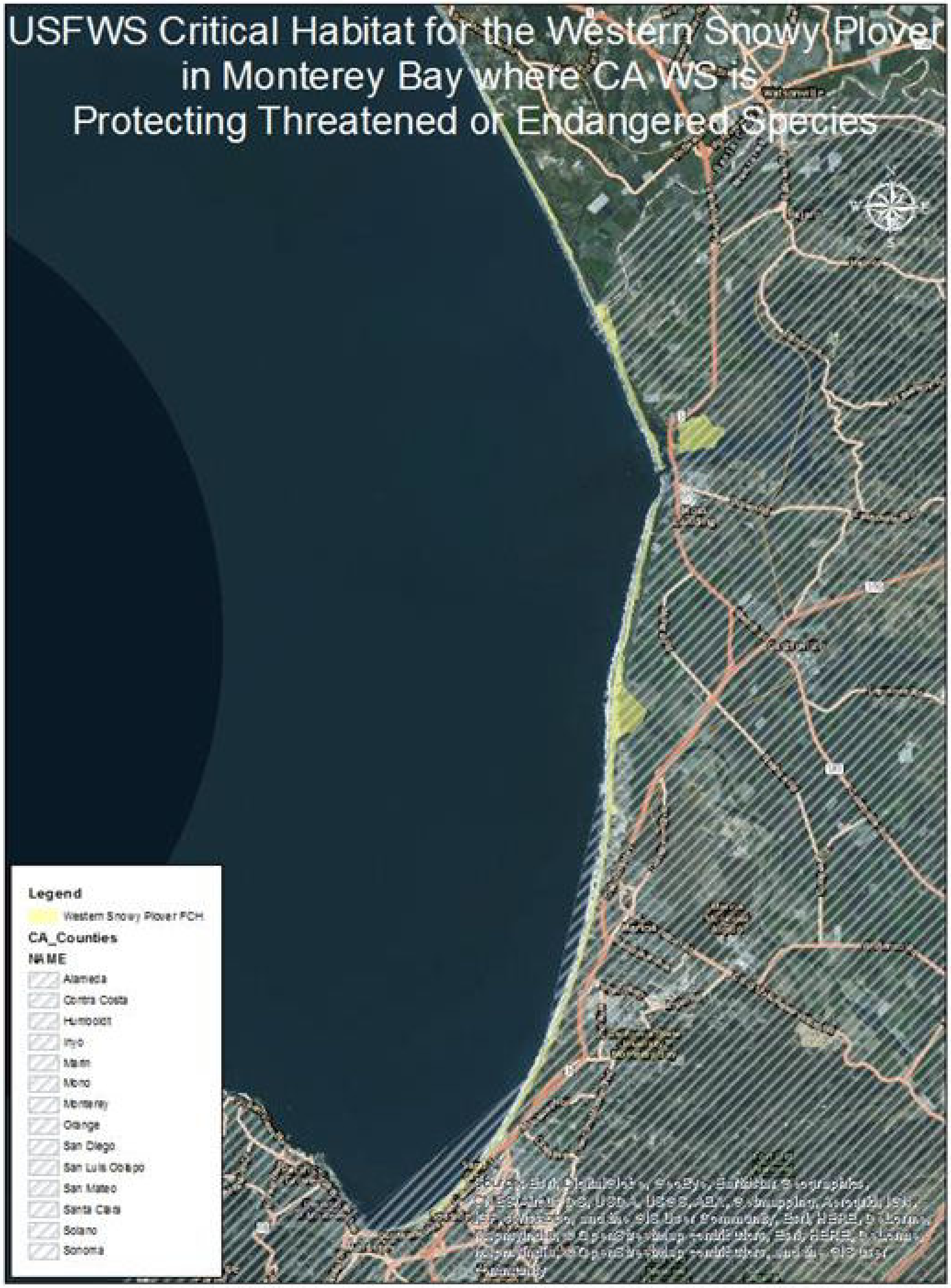
PESTICIDE STORAGE: Store only in original container, in a dry place inaccessible to children, pets, and domestic animals.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spilled bait, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Completely empty bags by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. If bags are not to be recycled, dispose of bags in a sanitary landfill or by incineration if allowed by State and local authorities. If burned, stay out of smoke.

Revised: 05-06-2016

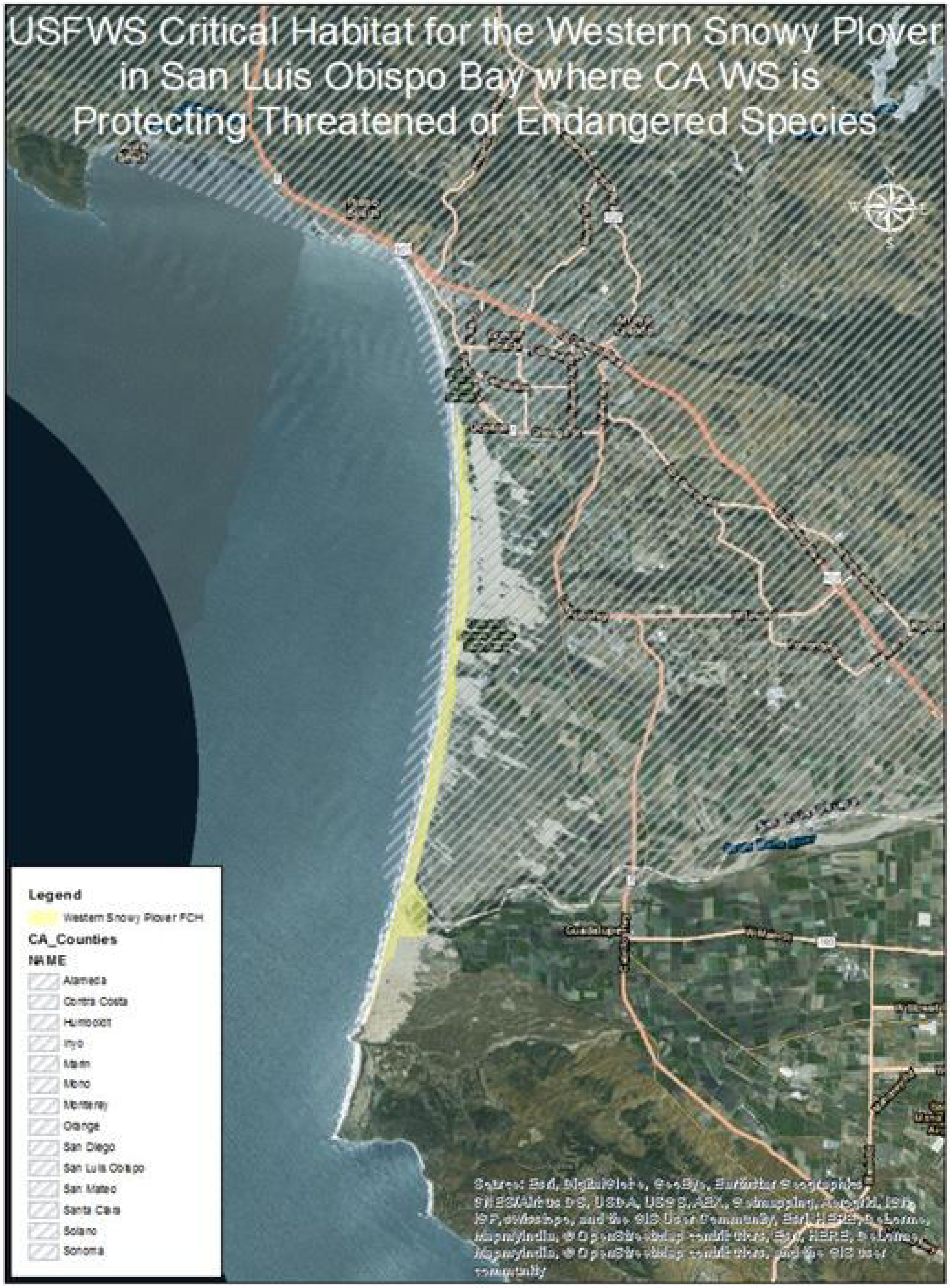

USFWS Critical Habitat for the Western Snowy Plover in Southern San Francisco Bay where CA WS is Protecting Threatened or Endangered Species
San Francisco Bay
Hayward
Fremont
Foster City
Newark
Sunnyvale
Santa Clara
Legend
Western Snowy Plover FCH
CA_Counties
NAME
Alameda
Contra Costa
Humboldt
Inyo
Marin
Mono
Monterey
Orange
San Diego
San Luis Obispo
San Mateo
Santa Clara
Solano
Sonoma



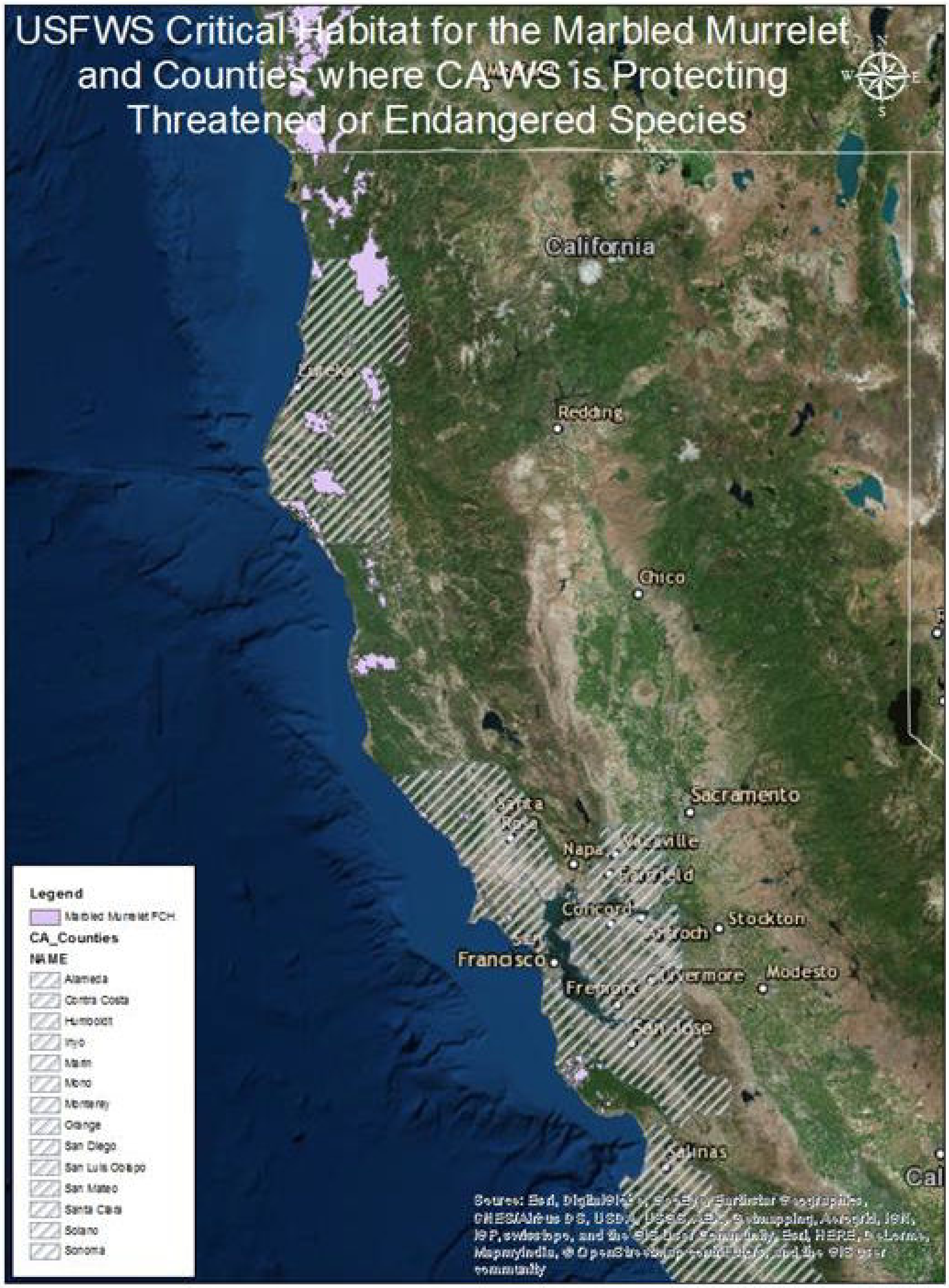
USFWS Critical Habitat for the Western Snowy Plover
in Monterey Bay where CA WS is
Protecting Threatened or Endangered Species
Legend
Western Snowy Plover FCH
CA_Counties
NAME
Alameda
Contra Costa
Humboldt
Inyo
Marin
Mono
Monterey
Orange
San Diego
San Luis Obispo
San Mateo
Santa Clara
Solano
Sonoma


USFWS Critical Habitat for the Western Snowy Plover
in Big Sur where CA WS is
Protecting Threatened or Endangered Species
Legend
Western Snowy Plover FCH
CA_Counties
NAME
Alameda
Contra Costa
Humboldt
Inyo
Marin
Mono
Monterey
Orange
San Diego
San Luis Obispo
San Mateo
Santa Clara
Solano
Sonoma
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community


USFWS Critical Habitat for the Western Snowy Plover
in Morro Bay where CA WS is
Protecting Threatened or Endangered Species
Legend
Western Snowy Plover FCH
CA_Counties
NAME
Alameda
Contra Costa
Humboldt
Inyo
Marin
Mono
Monterey
Orange
San Diego
San Luis Obispo
San Mateo
Santa Clara
Solano
Sonoma


USFWS Critical Habitat for the Western Snowy Plover in San Luis Obispo Bay where CA WS is Protecting Threatened or Endangered Species
Legend
Western Snowy Plover FCH
CA_Counties
NAME
Alameda
Contra Costa
Humboldt
Inyo
Marin
Mono
Monterey
Orange
San Diego
San Luis Obispo
San Mateo
Santa Clara
Solano
Sonoma

APPENDIX F


USFWS Critical Habitat for the Marbled Murrelet and Counties where CAWS is Protecting Threatened or Endangered Species
California
Redding
Chico
Sacramento
Napa
Stockton
Francisco
Modesto
Salinas
Legend
Marbled Murrelet FCH
CA_Counties
NAME
Alameda
Contra Costa
Humboldt
Inyo
Marin
Mono
Monterey
Orange
San Diego
San Luis Obispo
San Mateo
Santa Clara
Solano
Sonoma

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Southwest Region
2800 Cottage Way, Room W-2606
Sacramento, California 95825-1846

In Response Reply To:
Region 8-ES
08E00000-2019-F-0001

December 3, 2018

Mr. Dennis Orthmeyer
State Director
Animal and Plant Health and Inspection Service
Wildlife Services
3419A Arden Way
Sacramento, CA 95825

Subject: Programmatic Consultation for Predator Damage Management to Benefit Coastal Threatened and Endangered Species in the State of California

Dear Mr. Orthmeyer:

This letter transmits the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion (Opinion) based on our review of U.S. Department of Agriculture-Animal Plant Health Inspection Service-Wildlife Services (APHIS-WS) proposed Predator Damage Management to Benefit Threatened and Endangered Species Program (PDMTE) for coastal species protection in California for the next 10 years, and its effects on the marbled murrelet (*Brachyramphus marmoratus*), western snowy plover (*Charadrius nivosus nivosus* formerly C. *alexandrinus nivosus),* California clapper rail (*Rallus longirostris,* light-footed clapper rail (*Rallus longirostris levipes*), salt marsh harvest mouse (*Reithrodontomys raviventris*), and California least tern *(Sterna antillarum browni*); (in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.).* Your request for formal consultation was received on May 11, 2018.

The proposed action is APHIS-WS implementation of the PMDTE in coastal areas of California. The objective of the proposed action is to reduce depredation of the listed species in this consultation from avian, mammalian, and/or reptilian predators at the request of land managers. Actions conducted under PMDTE may include Physical Exclusion, Dispersal and Deterrent Devices, Live Capture Traps/Tools, and Lethal Tools/Techniques. The specific activities employed in these categories are detailed in your Biological Assessment on pages 14 through 25. In addition, the proposed action has interrelated and interdependent actions which include: 1) site access and staging of equipment and personnel; 2) transport of personnel and equipment within areas containing listed species; and 3) immobilization and disposal of targeted predators.

The enclosed Opinion is based on information provided in the May 2018 Biological Assessment (BA), amendments to the BA received in August 2018, meetings, other correspondence with APHIS-WS, and other sources of information available to us. A number of activities not addressed in the Biological Assessment were subsequently discussed and are reflected in this Opinion. A complete record of this consultation is on file at this office.

In your Biological Assessment, you determined that certain set of activities conducted under the proposed action (the PDMTE) would have "no effect" for a range of species addressed in this consultation. Proposed activities that you have determined to have no effect on listed species will not be discussed in this opinion. You also determined that no designated critical habitat would be affected for any listed species. There is no requirement for the USFWS to concur with "no effect" determinations. Your determination that certain activities under the PDMTE will not affect these listed species or critical habitat rests with APHIS-WS.

Your Biological Assessment concluded that your proposed action "may affect, likely to adversely affect" marbled murrelet, western snowy plover, California clapper rail, light-footed clapper rail, salt marsh harvest mouse, and California least tern. Therefore, the enclosed Opinion addresses the effects of your proposed action on those species. In the enclosed Opinion, we find that the adverse effects from the Project are not likely to jeopardize the western snowy plover, California clapper rail, light-footed clapper rail, or California least tern.

Based on our evaluation of the proposed action, including measures to minimize effects to species, we conclude that the PDMTE may affect, but is not likely to adversely affect the marbled murrelet or the salt marsh harvest mouse. If 1) new information reveals effects of the PDMTE that may affect the marbled murrelet and/or its critical habitat, or salt marsh harvest mouse, in a manner or to an extent not considered in this Opinion; or 2) the PDMTE is subsequently modified in a manner that causes an effect to these listed species or critical habitat not considered in this opinion, APHIS-WS should contact this office to determine if consultation should be reinitiated.

Recent genetic analyses of rail species resulted in a change in the common name and taxonomy of the large, "clapper-type" rails (*Rallus longirostris*) of the west coast of North America to Ridgway's rail (*Ralus obsoletus*) (Maley and Brumfield 2013; Chesser *et al*. 2014). Thus the California clapper rail (*Rallus longirostris obsoletus*), and light-footed clapper rail (*Rallus longirostris levipes*) are now referred to in the scientific community as the California Ridgway's rail (*Rallus obsoletus obsoletus*) and light-footed Ridgway's rail (*Rallus obsoletus levipes*). The change in the common name and taxonomy of these two clapper rail species, however, does not change the listing status of the species under the Act and they will be referred to by their original names in the Opinion.

Thank you for your continued interest in the conservation of endangered and threatened species. If you have any questions about this letter and Opinion or our joint responsibilities under the Endangered Species Act, please contact my staff Ellen McBride, Deputy Division Chief and Section 7 Coordinator, at (916) 414-6593 or Damian K. Higgins, Senior Advisor- Ecological Services, at (916) 414-6548.

Sincerely,

MICHAEL LONG Digitally signed by MICHAEL LONG
Date: 2018.12.04 16:16:52 -08'00'

Michael Long
Chief - Ecological Services

ENCLOSURE

BIOLOGICAL OPINION

FOR U.S. DEPARTMENT OF AGRICULTURE
ANIMAL PLANT HEALTH INSPECTION SERVICE-
WILDLIFE SERVICES

File No. 08E00000-2019-F-0001

U.S.FISH AND WILDLIFE SERVICE
PACIFIC SOUTHWEST REGIONAL OFFICE
SACRAMENTO, CALIFORNIA

MICHAEL LONG

Digitally signed by MICHAEL LONG
Date: 2018.12.04 16:17:30 -08'00'

Ecological Services Division Chief ______________________
Michael Long

Date ______________________

Table of Contents

I. Introduction

A. Consultation History

This consultation in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) began in early 2017 when U.S. Department of Agriculture's Animal Plant Health Inspection Service–Wildlife Services (APHIS-WS) began discussions with USFWS to prepare a request for consultation and begin drafting a Biological Assessment (BA) that would be modified from previous consultation efforts for their PDMTE. The following is a timeline of events that occurred in the establishment of the final BA that was provided to USFWS and our rendering of this Biological Opinion.

March 24, 2017 – Meeting with APHIS-WS and USFWS Region 8 Office personnel to discuss historical approach to predator management actions for benefit of six coastal listed species, organization of the Biological Assessment (BA), avian predator management actions, and determination assessments. (Mark Ono – WS Assistant State Director, Russel Odell – WS Staff Biologist, Shannon Chandler – WS Environmental Compliance, Ellen McBride – USFWS Section 7 Coordinator.)

May 5, 2017 – Meeting with APHIS-WS and USFWS Region 8 Office personnel to discuss approach to the BA, for benefit of recovery of the species, and to assess a path through Section 7 versus Recovery. (Mark Ono, Russel Odell, Shannon Chandler – WS; Ellen McBride, Dan Cox, Damian K. Higgins – USFWS Region 8 Office).

July 7, 2017 – Draft Biological Assessment received from APHIS-WS.

December 6, 2017 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions.

December 14, 2017 – Meeting with APHIS-WS management team (Assistant Regional Director, five District Supervisors, Mark Ono, and Shannon Chandler) and USFWS Region 8 personnel (Michael Fris – ARD, Michael Senn – DARD, Ellen McBride – Section 7 Coordinator) to discuss avoidance and minimization measures (AMMs) and effects from specific predator management actions, informal vs. formal consultation for listed species, and timeline.

December 21, 2017 – USFWS provided Avoidance and Minimization Measure (AMM) tables for California Least Tern and Marbled Murrelet to APHIS-WS.

December 22, 2017 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions. USFWS provided suggested AMM tables for California clapper rail, light-footed clapper rail, western snowy plover, and salt marsh harvest mouse.

December 28, 2017 – USFWS provided revised AMM matrices for California clapper rail and salt marsh harvest mouse to APHIS-WS.

December 29, 2017 – Conference call with APHIS-WS (Shannon Chandler, Eric Covington, and Kayla Brown) and USFWS (Ellen McBride and Tiffany Heitz – Region 8 Office, Anne Mankowski – Bay-Delta FWO) to discussion salt marsh harvest mouse and California clapper rail AMMs. USFWS provided a revised AMM matrix for snowy plover to APHIS-WS.

January 5, 2018 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions.

January 8, 2018 – Conference call with APHIS-WS (Shannon Chandler, Mark Ono, Kayla Brown, Eric Covington) and USFWS (Ellen McBride – Region 8 Office, Susie Tharratt – Arcata FWO) to discuss Snowy Plover predator management actions and AMM's.

January 12, 2018 – Conference call with APHIS-WS (Shannon Chandler) and USFWS (Ellen McBride and Tiffany Heitz - Region 8 Office, and Anne Mankowski – Bay-Delta FWO) to discuss salt marsh harvest mouse and California clapper rail data for take analysis.

January 12, 2018 – Conference call with APHIS-WS (Shannon Chandler, Eric Covington) and USFWS (Ellen McBride and Tiffany Heitz – Region 8 Office, Sandy Vissman – Carlsbad FWO) to discuss California Least Tern AMM's. USFWS provided revised AMM tables for California Least Tern to APHIS-WS.

January 16, 2018 – Conference call with APHIS-WS (Shannon Chandler) and USFWS (Ellen McBride – Region 8 Office, Sandy Vissman – Carlsbad FWO) to discuss California Least Tern AMMs.

January 17, 2018 – USFWS provided a revised AMM and frequency table for California clapper rail and salt marsh harvest mouse to APHIS-WS

January 19, 2018 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions. APHIS-WS provided some updates to the California least tern method frequency table.

January 24, 2018 – Conference call with APHIS-WS (Shannon Chandler) and USFWS (Ellen McBride – Region 8 Office, Sandy Vissman – Carlsbad FWO) to discuss California Least Tern take assessment approach.

January 25, 2018 – APHIS-WS provided comments on the USFWS' AMMs matrix for Marbled Murrelet.

January 29, 2018 – Conference call with APHIS-WS (Shannon Chandler), USFWS (Ellen McBride – Region 8 Office; Anne Mankowski and Kim Squires – Bay-Delta FWO) to discuss evaluation of take for salt marsh harvest mouse and California clapper rail.

January 31, 2018 – Conference call with APHIS-WS (Shannon Chandler), USFWS (Ellen McBride and Tiffany Heitz – Region 8 Office; Anne Mankowski – Bay-Delta FWO) to discuss evaluation of AMM's for salt marsh harvest mouse, California clapper rail and light-footed clapper rail.

February 1, 2018 – USFWS provided comments on the draft BA, as well as overarching considerations for its revision APHIS-WS.

February 2, 2018 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions.

February 7, 2018 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions.

February 14, 2018 – Meeting between USFWS Region 8 (Susan Boring, Damian K. Higgins, Ellen McBride, and Michael Fris) and APHIS-WS (Shannon Chandler, Mark Ono, and Dennis Orthmeyer) to discuss outstanding issues for the BA, establish needs for the consultation, and communicate project timelines for completion.

March 8, 2018 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions.

April 4, 2018 – Check-in conference call with APHIS-WS (Shannon Chandler) and Ellen McBride (USFWS) for consultation updates and questions.

June 21-22, 2018 – Email correspondence between USFWS (Damian K. Higgins) and APHIS-WS (Shannon Chandler) for clarifying conflicting project area descriptions, determining additional consultation needs, and anticipated timeline of BO completion.

August 23, 2018 – Call with APHIS-WS (Shannon Chandler) to request clarification on language (or need for additional information) in their BA regarding 1) effect determinations on neck/body snares, 2) definitions on the categories used in describing frequency of activities, and 3) missing literature references cited in the document.

B. Purpose and Organization of this Biological Opinion

In accordance with the requirements of section 7(a)(2) of the Act and its implementing regulations, the formal consultation process culminates in the USFWS's issuance of an Opinion that sets forth the basis for a determination as to whether the proposed federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat, as appropriate. The regulatory definition of jeopardy and adverse modification and a description of the formal consultation process are provided at 50 CFR1 402.02 and 402.14, respectively. If the USFWS finds that a proposed federal action is not likely to jeopardize a listed species, but anticipates that it is likely to cause incidental take of the species, then the USFWS must identify that take and exempt it from the prohibitions against such take under section 9 of the Act through an Incidental Take Statement.

C. Analytical Framework for the Jeopardy

In accordance with policy and regulation, the jeopardy analysis in this Biological Opinion relies on four components:

- *Status of the Species*, which evaluates the species range-wide condition, the factors responsible for that condition, and its survival and recovery needs.
- *Environmental Baseline*, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species.
- *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species.
- *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the species current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The jeopardy analysis in this Biological Opinion places an emphasis on consideration of the range-wide survival and recovery needs of the species and the role of the action area in the survival and recovery of the species as the context for evaluating the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

D. Analytical Framework for the Adverse Modification

In accordance with policy and regulation, the adverse modification analysis in this biological opinion relies on four components:

- *Status of Critical Habitat*, which evaluates the range-wide condition of designated critical habitat for the species in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall.

- *Environmental Baseline,* which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area.
- *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units.
- *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed federal action on critical habitat are evaluated in the context of the range-wide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the species.

In the case of the marbled murrelet and western snowy plover, the analysis in this biological opinion places an emphasis on using the intended range-wide recovery function of critical habitat, especially in terms of maintaining and/or restoring viable core areas, and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

II. Description of the Proposed Action

A. Action Area

The action area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR §402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment.

APHIS-WS routinely conducts PDMTE activities throughout California. APHIS-WS is a customer-service-based agency that responds to requests from private or public entities for assistance with animal-damage situations. As such, APHIS-WS generally works only in areas where predator impacts to threatened and endangered (T&E) species are likely to occur. APHIS-WS only works where requested and where Agreements for Control are signed by the land owner or management authority. Activities on public lands would be conducted at the request of permittees and in coordination with the appropriate land-management agencies.

Over the ten-year period of the proposed action, APHIS-WS may conduct activities almost anywhere in the State of California. However, under the PMDTE program (proposed action), the action area is defined to be the twenty California coastal counties (Alameda, Contra Costa, Del Norte, Humboldt, Los Angeles, Marin, Mendocino, Monterey, Napa, Orange, San Francisco, San

Diego, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, and Ventura counties) in the State of California that contain habitat supporting western snowy plover, California clapper rail, light-footed Clapper rail, California least tern, marbled murrelet, and salt marsh harvest mouse.

B. Proposed Action

The proposed action is APHIS-WS implementation of the PMDTE in coastal areas of California where listed species occur and are being depredated. The objective of the proposed action is to reduce depredation of the listed species in this consultation from avian, mammalian, and/or reptilian predators at the request of land managers. A complete list of predators targeted by the PDMTE program under this proposed action is provided in Table 1. Actions conducted under PMDTE to manage predators may include Physical Exclusion (fencing/barricades), Dispersal and Deterrent Devices (lasers, pyrotechnics, scarecrows & effigies, spotlights), Live Capture Traps/Tools, and Lethal Tools/Techniques. Specifics regarding methods employed in these categories are provided under "Specific Methods Used' section below. Also, actions include site use and access in area with listed species.

1. General Program Activities

APHIS-WS personnel use the APHIS-WS Decision Model (Figure 1.) (Slate *et al*. 1992) to determine the appropriate damage-management method(s) to implement based on several factors: 1) species responsible; 2) scope of the problem including magnitude, geographic extent, frequency, historical damage, and duration of the problem; 3) status of target and non-target species; 4) environmental conditions; 5) potential biological, physical, economic, and social impacts; 6) potential legal restrictions; and 7) costs of damage-management options. Slate *et al*. (1992) provides more detail on the processes used in APHIS-WS' Decision Model and USDA (1997) provides examples of how the model is used. APHIS-WS personnel usually give first preference to non-lethal methods that will stop the predator. However, APHIS-WS personnel are frequently contacted only after requesters have tried non-lethal techniques and found them to be inadequate for reducing damage to the requester's satisfaction. In some cases, such as anthropogenically abundant species preying upon threatened or endangered species (*e.g.*, feral cats preying on California least tern colonies at urban refuges or ravens (*Corvus* spp.) preying on marbled murrelet nests at State Park campgrounds), USFWS may request APHIS-WS to conduct lethal rather than non-lethal control.

Table 1. List of predators targeted for control methods by APHIS-WS.

BIRDS

Common Name	Scientific Name
American Crow	*Corvus brachyrhynchos*
American Kestrel	*Falco sparverius*
Barn Owl	*Tyto alba*
Black-crowned Night-heron	*Nycticorax nycticorax*
Burrowing Owl	*Athene cunicularia*
California Gull	*Larus californicus*
Caspian Tern	*Hydroprogne caspia*
Common Raven	*Corvus corax*
Cooper's Hawk	*Accipiter cooperii*
European Starling	*Sternus vulgaris*
Forster's Tern	*Sterna forsteri*
Glaucous-winged Gull	*Larus glaucesens*
Gray Jay	*Perisoreus canadensis*
Great-tailed Grackles	*Quiscalus mexicanus*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*
Great Horned Owl	*Bubo virginianus*
Greater Roadrunner	*Geococcyx californianus*
Gull-billed Tern	*Gelochelidon nilotica*
Gyrfalcon	*Falco rusticolus*
Heermann's Gull	*Larus heermanni*
Herring Gull	*Larus argentatus*
Horned Lark	*Eremophila alpestris*
Loggerheaded Shrike	*Lanius ludovivianus*
Long-eared Owl	*Asio otus*
Merlin	*Falco columbarius*
Northern Harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Peregrine Falcon	*Falco peregrinus*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Ring-billed Gull	*Larus delawarensis*
Rock Pigeon	*Columba livia*
Sharp-shinned Hawk	*Accipiter striatus*
Short-eared Owl	*Asio flammeus*
Snowy Egret	*Egretta thula*
Steller's Jay	*Cyanocitta stelleri*
Turkey Vulture	*Cathartes aura*
Western Gull	*Larus occidentalis*
Western Meadowlark	*Sturnella neglecta*
Western Scrub Jay	*Aphelocoma californica*
White-tailed Kite	*Elanus leucurus*

MAMMALS

Common Name	Scientific Name
Black Rat	*Rattus rattus*
Black-tailed Jack Rabbits	*Lepus californicus*
Bobcat	*Felis rufus*
Botta's Pocket Gopher	*Thomomys bottae*
California Ground Squirrel	*Otospermophilus beecheyi*
Cottontail rabbits	*Sylvilagus audubonii*
Coyote	*Canis latrans*
Deer Mice	*Peromyscus maniculatus*
Desert Woodrat	*Neotoma lepida*
Feral Cats	*Felis domesticus*
Feral Dog	*Canis domesticus*
Gray Fox	*Urocyon cinereoargenteus*
Long Tailed Weasel	*Mustela frenata*
Mink	*Mustela vison*
Norway Rat	*Rattus norvegicus*
Raccoon	*Procyon lotor*
Red Fox	*Vulpes vulpes*
Short Tailed Weasel	*Mustela erminia*
Shrew	*Soricidae*
Spotted Skunk	*Spilogale gracilis*
Striped Skunk	*Mephitis mephitis*
Virginia Opossum	*Didelphis virginiana*

REPTILES

Common Name	Scientific Name
California King Snake	*Lampropeltis getula californiae*
California Garter Snake	*Thamnophis sirtalis*
Pacific Gopher Snake	*Pituophis catenifer*
Southern Pacific Rattlesnake	*Crotalus oreganus*
Western Diamond Rattlesnake	*Crotalus atrox*

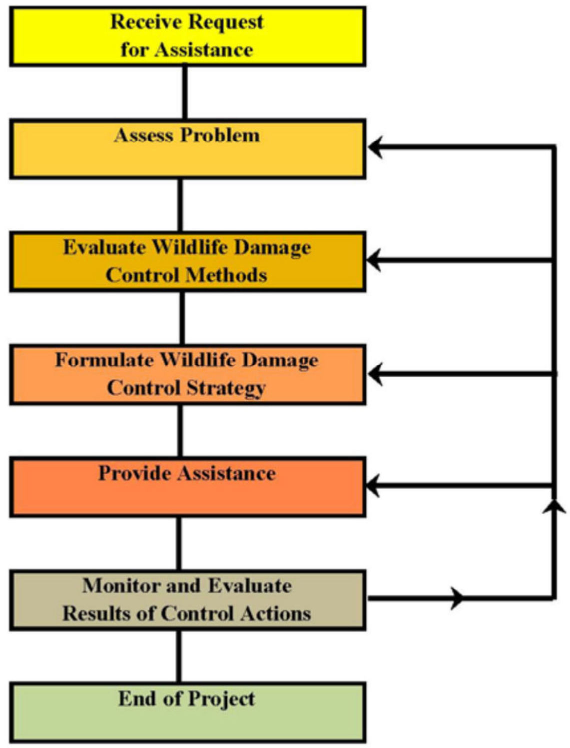


Figure 1. APHIS-WS Decision Model (Slate *et al*. 1992) (also known as the 7-step process)

APHIS-WS personnel assess the problem and evaluate the appropriateness of strategies and methods regarding legal, administrative, biological, selectivity, humaneness, feasibility, economic, and social considerations. Following this evaluation, the methods deemed practical for the situation are formed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. In terms of the APHIS-WS Decision Model, most damage-management efforts consist of a continuous feedback loop between receiving the request and monitoring the results with the damage-management strategy reevaluated and revised periodically.

2. Specific Methods Used

Actions conducted by APHIS-WS in the Action Area can be classified into two types of activities: Technical Assistance or Field Assistance. The methods employed by APHIS-WS within these activities fall into four categories: Physical Exclusion, Dispersal and Deterrent Devices, Live Capture Traps/Tools, and Lethal Tools/Techniques. Table A-1 in Appendix A summarizes the methods by the four categories, the types of predator species groups targeted by each method, expected frequency of method use, and locations or settings where these methods are typically used in the action area. More complete descriptions of each method used under the Proposed Action can be found in the APHIS-WS Biological Assessment. The methods determined by APHIS-WS to either likely adversely affect (LAA) or not likely to adversely affect (NLAA) the six ESA-listed species fall under the type of "field assistance" activities and are described in the following sections.

Field Assistance is initiated when predation problems on T&E species cannot effectively be resolved through technical assistance or when the resource owner/Agency has implemented non-lethal actions and predation continues. Field assistance could be provided for situations that require the use of methods and techniques that are challenging or unsuitable for the public to implement on their own. Resource owners/Agencies that are provided field assistance are also encouraged to use additional management strategies and sound husbandry practices, when and where appropriate, that could potentially further reduce predation.

a) Dispersal and Deterrent Devices

These devices rely on the use of sound, lights, pursuit, or other methods to frighten and disperse animals from the area to be protected. The success of frightening methods depends on animals' fear of, and subsequent aversion to, offensive stimuli. Once animals become habituated to a stimulus, they often resume their damaging activities. Persistent effort is usually required to consistently apply frightening techniques and then vary them sufficiently to prolong their effectiveness. Over time, some animals learn to ignore commonly used scare tactics that are no longer perceived as threats. In many cases animals frightened from one location become a problem at another. The effects of frightening devices on non-target wildlife must also be considered. For example, sensitive birds may be disturbed or frightened from nesting sites. Types of dispersal and deterrent devices include:

(1) Pyrotechnics, shell-crackers and scare cartridges

Pyrotechnics consist of a variety of noise making devices (in the form of fireworks) and may include the following:

- Double shotgun shells, known as shell-crackers or scare cartridges, are 12 -gauge shotgun shells containing a fire cracker that is projected up to 200 feet before exploding.
- Noise bombs, whistle bombs, racket bombs, and rocket bombs are used similarly to shell-crackers but are projected for shorter distances and fired from 15 millimeter flare pistols.
    - Noise bombs (also called bird bombs) are firecrackers that travel about 75 to 100 feet before exploding.
    - Whistle bombs are similar to noise bombs, but whistle in flight and do not explode. They produce a noticeable response

because of the trail of smoke and fire, as well as the whistling sound.
    - Racket bombs make a screaming noise in flight and do not explode. Rocket bombs are similar to noise bombs but may travel up to 150 yards before exploding.

For the purposes of T&E protection work, pyrotechnics could be used to frighten predatory birds away from nest and chick rearing areas of T&E species. The shells are fired so that they explode behind a predator and drive them further from the area. The purpose is to produce an explosion and discourage the predator from continuing to forage and/or cause disturbance on the T&E nesting site. It is extremely difficult to disperse birds that have already settled in a roost. APHIS-WS employees will consider the distance from T&E nest sites, disturbance being caused by the foraging raptor on site, alternative techniques including lethal removal of raptor, and possible disturbance to the T&E species before choosing to use pyrotechnics for T&E protection.

(2) Lasers

These have a narrow targeted beam that causes a temporary blinding effect, which elicits a flight response. The narrow beam is only visible at the source and target unless conditions are foggy limiting the laser's effect on non-target animals in the vicinity. Lasers have shown some effectiveness with dispersing gulls, vultures, and crows (USDA 2001). Best results are achieved under low-light conditions (*i.e.*, sunset through dawn) and targeting structures or trees proximate to roosting birds, thereby reflecting the beam (USDA 2001). When used repeatedly, target animals become rapidly accustomed to such lights and their long-term effectiveness is questionable.

(3) Scarecrows and Effigies

These often depict predator animals (*e.g.*, alligators, owls), people, or mimic distressed target species (*e.g.*, dead ravens, dead crows) and they are intended to elicit a flight response from target birds, which disperses those birds from the area. Avery *et al.* (2008) found that effigies could be effective as dispersing crows. When crow aggregations are relatively small, then effigies might suffice, but for large roosts, it is likely that reinforcement with additional methods, such as pyrotechnics or distress calls will be needed (Avery *et al.* 2008). Crow or raven effigies are mainly used to protect nesting colonies or individual nests from avian predators. In general, scarecrows would be most effective when they were moved frequently, alternated with other methods, and were well maintained. However, scarecrows tend to lose effectiveness over time and become less effective as populations increase (Smith *et al.* 1999), however, they have been used effectively to deter raptors from establishing nests on certain power structures by mimicking utility staff accessing the tower. For the purposes of T&E protection, scarecrow and effigy applications are limited to locations where their presence does not disturb the species being protected. Effigies could be used to disperse corvid roosts in proximity to T&E sites or to deter avian predators from using certain structures to hunt the T&E species provided the application location is out of sight of the species being protected or it is determined by site monitors/land managers that the effigy would not cause a disturbance of the protected species.

b) Live Capture Traps/Tools

Several methods are available to capture or take offending predators. The suitability and efficacy of any technique will depend on a variety of factors. The types of live capture traps/tools used by APHIS-WS in this Proposed Action are discussed below.

(1) Cage traps

Cage traps are selected for each damaging species by size, which can help limit non-target catches by physically excluding them from the trap or constructing them of material that allows smaller species to pass through. A brief summary of the specific types of cage traps is provided below. Traps are set near signs of damage or near known travel areas. Cage traps are almost always baited and when appropriate, baits are usually species-specific. At times, cage traps are placed over known entrances or exits of structures receiving damage. In these situations, baiting is unnecessary as the only movement path available for the offending animal is enclosed by the trap. Cage traps are easily transported and they may be utilized in all weather conditions.

(a) Small Cage Traps

Small cage traps are widely used by APHIS-WS for capturing small mammals, such as skunks, feral cats, raccoons, and squirrels. Cage traps vary in size and shape depending on the species being targeted with the largest for small mammals measuring 12x12x36inches. Typically they are made of welded wire or plastic, utilize a treadle type trigger system, and close with a spring door.

(b) Large Cage Traps

Large cage traps are occasionally used by APHIS-WS for the capture of coyotes, red foxes, feral dogs, feral swine and cougars. We define large cage traps as any cage trap larger than 12x12x36 inches, but not culvert traps. Large cage traps vary in size and shape depending on the species being targeted. Bobcat or coyote-size cage traps are made of welded wire, utilize a treadle type trigger system and close with a spring or gravity door. Large cage traps for the more powerful animals are typically made of commercial livestock panels made of 3/16 inch galvanized welded rods. The top, sides, front and bottom panels are welded together and panel openings are approximately 2 x4 inches. These cage traps may have a treadle type trigger and a single-catch, multi-catch or gravity door and can easily be transported by vehicle.

(c) Nest box traps

These traps are effective in capturing local breeding and post-breeding European Starlings and other targeted secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976) and operate similar to other live-capture traps. Nest box traps allow birds to enter but not exit.

(d) Nest/walk-in traps

Similar to box or decoy traps, walk-in cage traps are typically made of welded wire and have multiple gravity doors and are baited with grain. They are placed over an active nest or baited with food and allow the target bird to pass through a funnel, one-way, or drop down door that confines the target. Nest and walk-in traps are effective in capturing ground nesting birds, such as cormorants, ducks, geese, and ground feeding birds, including rock pigeons and mourning doves.

(e) Decoy traps

These traps are similar in design to the Australian Crow Trap as reported by McCracken (1972) and Johnson and Glahn (1994) or typical pigeon traps. Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds, which enter the trap through one-way doors and are unable to exit. Active decoy traps are monitored daily or more frequently as appropriate remove and euthanize excess birds and to replenish bait and water.

(f) Swedish Goshawk traps

A large box made of wood and wire mesh, which has a top that opens up. This construction typically measures approximately 1x1x1m and can be a permanent structure. Bait is set inside the box, or in a separate wire mesh compartment under the main area of the box, and the hawk or owl drops in from the top. The raptor entering the trap triggers the two pieces of the roof to close behind it, trapping the raptor in the box.

(g) Bal-Chatri traps

These traps consist of a small wire cage with monofilament nooses attached to the top, baited with a mouse or other live bait. Cages are generally constructed of ½-inch wire hardware cloth and may be from 2-3 inches tall, by 10-14 inches square. Larger Bal-chatri traps (using rabbits as bait) have been successfully used for capturing red-tailed hawks. For smaller species (*i.e.*, shrikes and kestrels) nooses should be approximately 1½" in diameter and of good quality monofilament fishing line (8-12 lb.

test). For larger species (*e.g*., red-tailed or red-shouldered hawks) the nooses should be made of 20-25 lb. test line, and from 2½-3 inches in diameter. A 2-4 lb. weight must be attached to the trap using a strong line (such as parachute cord) of about 4-6 ft. in length.

(h) Pigeon harnesses
These devices are small backpack-style, leather trapping apparatuses' secured to a live pigeon or European starling allowing the bait bird its full range of motion. Heavy weight mono-filament line tied into sliding nooses is attached to the backpack, with either a ground anchor or weight to secure everything to the ground. The pigeon harness is deployed similarly to the Bal-Chatri. This method is particularly good for peregrine falcons. Harnessed pigeons are used to entangle target raptors. This method is constantly monitored and only used in a colony where a target raptor is already posing a threat to the nesting colony.

(2) Foot-hold Traps

Foot-hold Traps are versatile and used by APHIS-WS for capturing many predator species on private lands. Traps placed in the travel lanes of the target animal, using the animal's movement patterns to determine trap placement rather than attractants, are known as *"blind sets."* More frequently, traps are placed as *"baited"* or *"scented"* sets. These trap sets use an attractant consisting of visual attractants (*e.g.*, feathers) or olfactory attractants (*e.g.*, fetid meat, urine, or musk) to attract the animal. In some situations, a "draw station," such as a carcass, animal parts, or a large piece of meat, is used to attract target predators. In this approach, one to several traps are placed in the vicinity of the draw station. In order to protect scavenging birds, including eagles, APHIS-WS program policy prohibits the placement of traps closer than 30 feet to a draw station or visible bait, with the exception of traps placed for bears, mountain lions, or raptors (bear and lion sets are selective for large heavy animals, and raptor sets are specifically intended to capture these birds). Advantages of the foot-hold trap are: (1) they can be set under a wide variety of conditions; (2) some targets can be translocated after capture; (3) non-target captures can usually be released; (4) trap placement and bait selection can minimize non-target take; (5) animals much larger than the target species can usually pull themselves free from smaller foot-hold traps without injury; and (6) pan-tension devices can reduce the probability of capturing non-target animals smaller than the target species (Turkowski *et al*. 1984, Phillips and Gruver 1996). In accordance with APHIS-WS policy, APHIS-WS foot-hold traps use pan-tension devices, and have padded jaws to reduce injury. More specifics are discussed below.

(a) Padded-jaw foot-hold traps
These come in several sizes depending on the target species. They are a two coil spring trap with rotating jaws. They have inline shock springs

centrally attached and swivel to allow for movement and are equipped with non-hardening rubber on the face of the jaw. These traps are designed to close on an animal's foot and hold an animal without injuring it. These traps have adjustable pan tension triggers which allow the exclusion of animals smaller than the target species. Padded-jaw foot-hold traps can be used in California for the protection of Threatened/Endangered species. (In Nat. Audubon Society v. Davis (N.D.Cal. 2000) 144 F.Supp.2d 1160, the United States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of padded-jaw traps for the protection of endangered species.)

(b) Pole traps (Verbail or modified padded-jaw foot-hold traps)
These are placed on top of a pole and are primarily used to capture raptors. "Pole traps are live traps that can be effective and humane tools for alleviating certain problems caused by raptors" (USFWS 2005). Depending on species being trapped, the modified padded-jaw foot-hold trap size, pole height, trap placement, and trap location are all taken into consideration by APHIS-WS personnel prior to setting. The padded-jaw foot-hold traps are highly modified with the original springs either replaced or weakened in addition to having off-set jaws, which give more room for the animal's foot to move, and either surgical tubing or foam rubber securely attached to the already rubberized jaw for extra padding. Traps are attached to a non-tangling rod or guide wire that runs from the trap down the pole to the ground. Once live-captured by the trap, the trap and raptor slide down the guide wire to the ground for handling.

A verbail trap is mounted to a pole that is deployed in an open area away from any other perches of similar or greater size, which attracts raptors that use perches for hunting to land on the trap. The perch is collapsible and acts as the triggering mechanism. When tripped, the body of the trap flips a padded noose around the leg(s) of the raptor. Two spring-wired arms tied to the noose simultaneously spring out in opposite directions, tightening the noose and holding the bird firmly. A separate line attached to the noose allows the trapped raptor to flutter to the ground, while remaining tethered to the pole.

(3) Nets

(a) Bow nets
The bow net is a circular, spring loaded, and netted trap, that lies folded on the ground. The trap is baited with a lure animal that is tethered to the center of the trap, in order to attract the attention of a passing raptor. The movement of the lure animal (natural or stimulated by pulling a line attached to the tethered animal) will attract the raptor and it will make a stoop down to capture the lure. The trap is sprung just as the raptor arrives at the lure, causing one half of the circle to release over the raptor, creating a net over the now trapped bird. These traps can be sprung manually by

pulling a rope or line connected to a pin that holds the trap folded together, using a remote controlled release mechanism, or can have an automatic release that is tripped by the raptor.

(b) Drop nets

Drop nets are suspended over a pre-baited site and manually or remotely triggered to drop on target animals or manually dropped on target birds from a high site, such as a bridge or rooftop. Decoys may also be used to enhance the effectiveness of drop nets.

(c) Cannon/Rocket nets

These nets are normally used for larger birds, such as geese or pigeons, and use mortar projectiles or compressed air to propel a net up and over birds that have been baited to a particular site.

(d) Mist nets

Mist nests are commonly used for capturing small-sized birds, but can be used to capture larger birds, such as ducks and smaller raptors. It was introduced into the United States in the 1950s from Asia and the Mediterranean, where it was used to capture birds for the market (Day *et al*. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines the bird species that could be caught, and overlapping pockets in the net cause birds to entangle themselves when they fly into the net. Decoys and electronic calls may also be used to enhance the effectiveness of mist nets.

(e) Net guns/launchers

Net Guns of various sizes have occasionally been used by APHIS-WS to catch target predators on the ground. These shoot from a "rifle with prongs," go about 20 yards, and wrap around the target animal. This method under the proposed action is normally used for flocking birds, such as waterfowl and European Starlings. They use a firearm blank or compressed air to propel a weighted net up and over birds, which have been baited to a particular site or birds that do not avoid people. Net guns are manually discharged while net launchers are remotely discharged from a nearby observation site.

(f) Dho-gazza traps

The dho-gaza is a small net attached at its four corners to a pole frame. The net is attached in such a way as to be easily pulled off the pole frame (*e.g*., clothepins, paperclips, etc.). A cinch-line string attached at one end of the pole frame is run through the outer mesh squares of the net along all four sides, and then attached again to the frame. A lure animal is tethered to the ground near the base of the trap. Prey species, such as sparrows and starlings, or predator species like great horned owls, can be used to attract the raptor. The trap is positioned within sight of a raptor, and perpendicular to the path the raptor is expected to take to get the lure animal. The lure animal is placed on the opposite side of the net from the raptor. The movement of the lure animal (natural or stimulated by pulling a line attached to the tethered animal) will attract the raptor and it will make a stoop down to capture the lure. Before the raptors gets to the lure, the raptor will hit the net, which detaches from the pole frame, and the cinch-line string will close the net behind the raptor, effectively forming a net bag around the raptor.

(4) Snares

Snares made of wire or cables are among the oldest existing tools. They can be used effectively to catch most species, but are most frequently used to capture coyotes, fox, and other large mammals. They are much lighter and easier to use than foot-hold traps and are not generally affected by inclement weather.

(a) Neck or Body Snares

Neck-snares can be effectively used wherever a target animal moves through a restricted lane of travel (*e.g.*, "crawls" under fences, trails through vegetation, or den entrances). When an animal moves forward into the loop formed by the cable, the loop tightens and the animal is held. Neck-snares may be employed as either lethal or live-capture devices depending on how or where they are set. Neck-snares are usually lethal, but "stops" (devices to keep the snare loop from tightening to the extent that it would kill the animal) can be attached to the cable to make the snare a live-capture device.

Snares can incorporate a breakaway feature to release non-target wildlife if the target animal is significantly smaller than these potential non-targets (Phillips 1996). The size and placement of the snare can afford some species-selectivity, but they are generally not considered to be species-specific. As such, snares should be set in locations where the likelihood of capturing non-target animals is minimized. In some situations, using snares to capture wildlife is impractical due to the behavior or morphology of the animal, or characteristics of the particular location of the wildlife damage situation.

(b) Foot or leg snares

The foot- or leg-snare is a spring-powered non-lethal device, activated when an animal places its foot on the trigger. Foot-snares can used effectively to capture large predators, such as mountain lions and black bears. Additionally, several foot-snare designs have been developed to capture smaller predators, such as coyotes and bobcats. In some situations using snares to capture wildlife is impractical due to the behavior or morphology of the animal, or the location of many wildlife conflicts. Snares must be set in locations where the likelihood of capturing non-target animals is minimized. APHIS-WS uses a leg snare with a built-in pan tension device that can be set to exclude capturing animals lighter than the target animal.

(5) Catch-poles

Catch-poles can be used to capture an animal by hand (typically diseased, injured, or entrapped animals) or safely handle predators to remove them from traps. The device consists of a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. APHIS-WS uses catch poles infrequently, primarily to safely capture feral domestic species that allow personnel to approach them or to remove live animals from traps without danger to or from the captured animal.

c) Lethal Tools/Techniques

(1) Grid searches

This method is performed for the purpose of locating and removing gopher snakes and California king snakes in and around California least tern nesting areas with input and assistance from the site managers, biologists, and monitors. Grid searches involve 1-3 personnel walking more or less in formation a few feet apart (vegetation dependent) through an affected area to search for snakes. There may be a need to search within the nesting colony or immediately adjacent to it. APHIS-WS coordinates with monitors ahead of time and reads the on-site log books for current site/nesting information. They will advise as to areas to avoid, or times of day, temperature (*i.e.*, too hot, too cold), etc. Monitors accompany APHIS-WS personnel in most instances, when there is a need to enter the nesting colony (*i.e.*, to investigate predation, following tracks, search for snakes, etc.). Once snakes were located they were captured by hand and euthanized. Funnel traps and tube traps, combined with short sections of drift fence or set along existing linear objects on the site, have also been used to capture snakes. These arrays bordered areas where evidence of snakes was observed, or where they were likely to intercept foraging snakes prior to entering the nesting area. The fence material was interspersed with tube traps and funnel traps at regular intervals to capture snakes moving along the drift fence. Funnel traps were baited with live mice to increase effectiveness, while tube traps were typically not baited.

(2) Rodent Traps (snap-type only)

These traps are often used to collect and identify rodent species that cause damage, so that species-specific management tools can be applied. If an infestation is minor, these traps may be used as the primary means of management. Snap traps used for rat control are not typically set where terns, plovers, or rails could come in contact with them. Rodent traps are not used in salt marsh harvest mouse habitat.

(3) Shooting (from ground only)

Shooting is conducted with hand guns, rifles, and shotguns. APHIS-WS Directive 2.615 and the required National Rifle Association (NRA) training require APHIS-WS personal to only shoot at known targets where adequate backstop exists to stop the projectile. For PDMTE activities, shooting is frequently performed in conjunction with calling particularly for species, such as common ravens and American crows. Calling/shooting is important for the management of wildlife that may have become wise to other management methods, such as traps and deterrents. Shooting is a highly selective method, which is typically used to remove a single problem individual. Shooting is limited to locations where it is safe to discharge firearms. Shooting to supplement harassment typically enhances the effectiveness of harassment techniques and can help prevent bird habituation to hazing methods (Kadlec 1968). Shooting is an essential management option, but may be relatively expensive because of the on-site staff hours required.

Firearms create short duration high intensity sound. When possible without reducing the effectiveness of the technique, APHIS-WS uses suppressors and specific ammunition to minimize the audio report of firearms. Suppressors and subsonic ammunition are most commonly used with rifles. Shotguns are commonly used for corvid and gull removal and cannot always be suppressed without affecting shot pattern and/or accuracy. APHIS-WS employees consider disruption caused by noise whenever selecting a method that causes audio reports, such as firearms and pyrotechnics. When possible, APHIS-WS will maximize the buffer distance between T&E species and the use of audio methods, however in the case of predators actively foraging in the nest/breeding area, the audio disturbance created by a firearm may be preferable to the risk of predation from allowing the predator to continue foraging. In particular settings like T&E sites on airports and military bases, the audio disturbance created by firearms used for PDMTE may be discountable when compared to the baseline audio levels on site. However, for more rural sites, audio disturbance will be discussed with site monitors and land managers to ensure that any audio disturbance is not substantial enough to cause nest abandonment or other effects in the protected species.

Night shooting of nocturnal predators may be conducted with spotlights or night vision. Night vision use is imperceptible to the surrounding environment and so will not affect the protected species. Spotlights are high intensity lights that are used to identify and cause a temporarily pause in a target species movement. APHIS-WS will exercise caution when using spotlights near T&E nesting/breeding areas. Whenever possible, APHIS-WS will focus lights away from the protected species. APHIS-WS will access protected species response to spotlight use and discontinue or increase buffer distance if necessary. Shooting can be used in conjunction with calling devices to draw a predator within range. Calling devices can be manually blown or electronic. In all cases, the noises emitted by the device are intended to mimic the sounds and volume of an animal in nature. Calls may replicate the sounds of prey species in distress (*e.g*., wounded rabbit) or the conspecific calls of the target species (*e.g*., mobbing crows). APHIS-WS uses care when selecting calling locations as to create a safe backstop for shooting and considers the approach direction of the animal so predators are not drawn through T&E use areas.

(4) Egg addling/destruction

Egg addling and destruction are methods of suppressing reproduction in local predating bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times, which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid, which covers the entire egg and prevents the egg from obtaining oxygen (see egg oiling below).

(5) Egg oiling

Egg oiling is a method for suppressing reproduction of predating birds by spraying a small quantity of food grade corn oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability (Pochop 1998, Pochop *et al*. 1998). The method has an advantage over nest or egg destruction in that the incubating birds generally continue incubation and do not re-nest. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. This method is extremely target specific and is less labor intensive than egg addling.

(6) DRC-1339

DRC-1339 is a slow acting avicide that is registered by APHIS-WS with the EPA for use on a number of species (*e.g*., ravens, crows, pigeons, gulls, blackbirds, and starlings), on various bait carriers, such as grain, meat baits, eggs, sandwich bread, and cull French fries. DRC-1339 is only available for use by APHIS-WS. For PDMTE, DRC-1339 would be used in accordance to label directions for corvids and gulls (see product labels, APHIS-WS Biological Assessment, Appendix D). The EPA labels give specific instructions for bait preparation, pre-baiting period, and application limits for the product. If non-target species are observed near the pre-bait, the product will not be applied.

DRC-1339 was developed as an avicide, because of its differential toxicity to mammals and birds. DRC-1339 is highly toxic to sensitive species, but only slightly toxic to non-sensitive birds, predatory birds, and mammals. Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species, such as raptors (Schafer, Jr. 1981), sparrows, and eagles are classified as non-sensitive. Acute oral toxicity data suggested some taxonomic groupings of birds were far less susceptible to CPTH than others (Eisemann et. al 2003). Secondary poisoning has not been observed with DRC-1339 treated baits. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to non-target and T&E species (EPA 1995). This can be attributed to relatively low toxicity to species that might scavenge on birds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. The half-life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (*i.e.*, degradation chemicals) have low toxicity. DRC-1339 is highly soluble in water, but does not hydrolyze, and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility.

3. Interrelated and Interdependent Actions

The implementing regulations for Section 7 define interrelated actions as those that are a part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Those actions identified as such are described below and are included as part of the effects analysis in this Opinion for each species.

a) Human Presence and Travel (by Foot, Vehicle, or Watercraft)

The most significant interrelated or interdependent action is human presence and travel (by foot, motorized vehicle, or water craft) in areas that normally would not be accessed, or would be accessed measurably less often in the absence of these proposed activities.

All predator control activities described in this proposed action require deployment by APHIS-WS personnel on site. Therefore, presence and travel by APHIS-WS is in or near habitats that contain the threatened and endangered species subject to this consultation. Most travel is either by truck on established or designated roads (both paved and unpaved), or off-road via walking on foot. All-Terrain Vehicles (*e.g*., quads) are sometimes used where access to trucks is not practical. These all-terrain vehicles are not used off established trails on public lands without appropriate authorization. Quads are mostly used in settings where the ground is too wet for pick-up truck travel. Where public scrutiny or perception is an issue, APHIS-WS may use well-marked pick-up trucks with emblems and lights, rather than quads. This will avoid the perception that sensitive areas are open to off-road or other motorized vehicle use.

In limited circumstances when weather, tides, or combination of the two prevents access to a T&E protection site, APHIS-WS may use watercraft to access the location. APHIS-WS will consult with land manager/site monitor on aspects of watercraft access for specific sites. APHIS-WS personnel will follow safety measures described in APHIS WS Directive 2.630 and adhere to "No Wake" speed limits when traveling near T&E protection sites.

b) Disposal of Targeted Predators

Drugs are important tools for managing wildlife. Euthanasia is performed with sodium phenobarbital. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. Drugs are monitored closely and stored in locked boxes or cabinets according to APHIS-WS policies, and Department of Justice or Drug Enforcement Administration guidelines. Most euthanasia drugs are controlled substances which can only be used under license from the U.S. Department of Justice's Drug Enforcement Administration. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take.

All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods as described by AVMA Guidelines for the Euthanasia of Animals: 2013 Edition and in accordance with APHIS-WS Directive 2.505. Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

While rare, agencies such as USFWS, CDFW, or conservation and research organizations with appropriate permits may request carcasses in order to collect data from those individual carcasses, or may request the use of those carcasses in collecting other data (*e.g*., scavenging rates at facilities where approved mortality monitoring is occurring). They may also use collected animals to conduct research on predators. Other parties collecting information may request carcasses for their use, if they have all necessary state and/or federal permits needed. For instance, raptor researchers may request pigeons or starlings to use in capturing raptors.

c) *Release or Rehabilitation of Avian Predators and Non-Targeted Wildlife*

All non-target wildlife (animals determined not to be a threat to protected species) that is captured unharmed will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility.

All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center, until they can be released back into the wild. Release will be at a suitable location after the threatened or endangered species nesting season(s) has/have completed. Holding facilities and the location of all release sites must be approved by the resource land owner/agency. Hold time periods may be subject to MBTA permit requirements depending upon species.

d) *Staging and Access*

Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS activities do not generally require staging areas. APHIS-WS activities are primarily temporary, as are any structures they place in the field. Temporary structures are removed following operations.

e) *Use of Night Vision, Spotlights, and Calling Devices*

Shooting may be conducted at night-time utilizing night vison optics. Night vision optics use image enhancement technology to collect all the available light, including infrared light to amplify it so that APHIS-WS personnel can see predator movement in the dark for targeting and shooting. Spotlights are also used in concert with shooting of targeted nocturnal predators. A high intensity light is used to identify and cause a temporary pause in the targeted predator's movement, thus enabling a higher probability of shooting success.

Another interrelated action to shooting that helps increase probability of success is utilization of calling devices. Manually blown or electronic, calling devices emit noises intended to mimic the sound and volume of an animal for the purpose of attracting a predator. Upon attracting the predator, APHIS-WS personnel can improve targeting the predator for shooting.

4. Frequency of Actions

The frequency at which APHIS-WS will be implementing the above described actions will vary and depend upon the species being protected, site-specific conditions, and the targeted predator(s). APHIS-WS provided categories of the anticipated frequency of these actions for each species in their Biological Assessment (Table 3, page 24). APHIS-WS provided definitions for these categories (pers. comm., email from Shannon Chandler to Damian Higgins, August 28, 2018) to provide context for an effects analysis:

- Common daily: 4+ days per week during T&E protection season and at least 100+ applications in a 10 year period.
- Common weekly: 1+ days per week, 3 applications/month, and/or 50+ applications in a 10-year period.
- Infrequent: 3 or fewer applications per month and 10-50 applications in a 10-year period.
- Rare: less than 10 applications in 10-year period.
- Not used: 0 applications in a 10-year period.

C. Term of Action

APHIS-WS intends to continue to implement PDMTE action in the State of California indefinitely. APHIS-WS has committed, as a component of their action, to meet with the USFWS annually to make sure the Assessment and Opinion are up to date, conservation measures are being implemented and working properly, and that the assumptions remain valid. The USFWS considers this consultation to extend 10 years only if there are no changes that trigger re-initiation of this consultation (see Reinitiation below) and the annual review(s) confirm(s) ESA coverage is appropriately documented.

D. Measures to Reduce Impacts

Based upon conversations and meetings between APHIS-WS and USFWS for the Proposed Action, general measures and standard operating procedures (SOPs) were identified for implementation. Although these measures and SOPs were not described in the Biological Assessment, USFWS provides a description of those general measures and SOPs below and assumes their implementation as part of the Proposed Action for this Biological Opinion. APHIS-WS has also identified specific management actions to reduce the degree of impact from PMDTE actions to listed species and their designated critical habitat. These measures are summarized under “Species-Specific Measures” and are described on pages 28, 32, 33, 36, 40, 43, 44, and 46 of the Biological Assessment.

1. General Measures and Standard Operating Procedures

Certain actions are common to most APHIS-WS control activities. Prior to initiating activities, APHIS-WS considers the likelihood of encountering listed or other non-target species, as well as pets, livestock, and people. APHIS-WS personnel check appropriate range maps and other data provided by agencies (such as CDFW and USFWS) regarding occupancy of listed species habitats. When necessary, APHIS-WS contacts the agencies to obtain the latest and most-precise information. This information influences the types of methods used, the conservation measures applied, and the amount of pre-activity reconnaissance. Site reconnaissance occurs as APHIS-WS staff evaluates which methods to apply and whether non-target species may be a concern. The following is a summary of general Standard Operating Procedures used by APHIS-WS in implementing the PDMTE program in the action Area.

- APHIS-WS complies with all applicable laws and regulations that pertain to working on federally managed lands.
- APHIS-WS coordinates with Tribal officials for work on Tribal lands to identify and resolve any issues of concern with PDMTE.
- The use of PDMTE methods, such as traps and snares, conforms to applicable rules and regulations administered by the State, as well as APHIS-WS Directives.
- APHIS-WS personnel adhere to all label requirements for toxicants and pesticides. EPA approved labels provide information on preventing exposure to people, pets, and T&E species, along with environmental considerations that must be followed. APHIS-WS personnel abide by these restrictions.
- The APHIS-WS Decision Model (Slate *et al*. 1992) is consistently used by APHIS-WS employees when determining appropriate WDM methods. This Model is designed to identify effective wildlife damage management strategies as well as their impacts.
- PDMTE is directed toward localized populations or individual offending animals, depending on the species and magnitude of the problem, and not an attempt to eradicate any native wildlife population in a large area or region.
- APHIS-WS use specific trap types, lures, and placements that are most conducive to capturing the target animal with the least amount of injury, consistent with APHIS-WS Directives 2.101, 2.105, 2.450, and 2.455.
- APHIS-WS will use Best Management Practices for Trapping by using approved foot-hold, restraining, and kill traps to capture predatory animals.
- APHIS-WS personnel are trained to select the most appropriate method(s) for taking problem animals with little impact on non-target species.
- APHIS-WS personnel work with research programs, such as the APHIS-WS National Wildlife Research Center to continue to improve the selectivity of management devices.
- Traps and snares are not set within 30 feet of exposed carcasses (*i.e*., “draw stations”) in order to prevent the unintentional capture of scavenging birds, such as bald eagles and ravens. The only exception to this policy is for the

capture of target raptors (raptor sets are specifically intended to capture these birds).

- Pan-tension devices for foot snare triggers and foot-hold traps are used by APHIS-WS, as appropriate, throughout the Action Area to reduce the capture of non-target wildlife that weigh less than the target species.
- Breakaway snares, designed to break open and release when tension is exerted by a larger non-target animal, such as deer, antelope or livestock, have been developed and are being refined. These snares will be implemented into the APHIS-WS program as appropriate.
- Non-target animals captured in foot-hold traps or foot snares are released at the capture site unless it is determined by APHIS-WS Specialists that the animal is not capable of self-maintenance.
- PDMTE activities are directed at towards individual problem animals, or local populations, to resolve damage problems associated with them.
- APHIS-WS personnel will know how to identify sign of the target and T&E species (*e.g.*, gull vs. California least tern), and apply PDMTE methods accordingly.

While these techniques and devices can be part of the proposed action, they may not be practicable or feasible in all situations. Because we do not know when or to what extent such technology may be employed, we take a worst-case approach in this analysis and do not rely on such additional injury-reduction methods.

2. Species-Specific Measures

Looking at historical data from previous PDMTE efforts conducted by APHIS-WS, California least terns are the only species that have had instances of lethal take that occurred (four instances from pole traps between 1989 and 2006; two instances from rodent snap traps in 1998 and 2003). Absent of these instances, there have been no other reports of other federally listed species incidentally captured or killed by APHIS-WS personnel conducting PDMTE efforts in California. This has been accomplished through APHIS-WS minimizing the amount of predator control they do, as well as the use of a variety of means to achieve species specificity, such as the selection of the following:

1. Control mechanism (type of trap or application)
2. Size of trap and force needed to trigger
3. Type or absence of baits
4. Type or absence of scents
5. Type or absence of visual attractants
6. Specific location of control action
7. Individual selection methods
8. Pre-control reconnaissance and surveys

After correcting pan tension in pole trap devices and modifying how snap traps are set in rip-rap areas, no lethal take of California least terns has occurred since 2006. Detailed species-specific measures that APHIS-WS will implement under this proposed action are as follows:

a) Marbled Murrelet

1) APHIS-WS will conduct all actions from the ground.
2) APHIS-WS will use suppressors paired with subsonic ammunition to limit noise when using rifles.
3) APHIS-WS will not direct firearms into the canopy of the old growth habitat.

b) Western Snowy Plover

1. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding plovers.
2. When entering a nesting colony, activities shall be conducted as unobtrusively as possible and with the least amount of disturbance to the colony (Special Terms and Conditions for PRBO Permit 2001). Visits to trap sites near nests will be limited to minimize potential harassment and to minimize attracting other predators. Visits to control sites will be done in cooperation with biologists monitoring the protected nests to best avoid disturbing incubating adult shorebirds.
3. Minimizing disturbance to western snowy plovers: APHIS-WS attempts to minimize disturbance to nesting western snowy plovers during certain climatic conditions, such as high wind, extreme cold and extreme heat. As with terns, attempts are made to minimize the amount of time spent in western snowy plover nesting areas (Special Terms and Conditions for PRBO Permit 2001).
4. The distance between trap sites and snowy plover nests will be as great as possible to eliminate or minimize any visual disturbance to the nests yet accomplish the specific predator control objective.
5. Hazing with pyrotechnics will be used only beyond 250 feet from a known Western snowy plover nest.

c) California Clapper Rail

1. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding rails.
2. If boats are required for marsh access, the speed of the boat will be reduced when approaching the marsh (Special Terms and Conditions for PRBO Permit 2001).
3. Disturbance to rails will be minimized to the maximum extent possible during the breeding season (Special Terms and Conditions for PRBO Permit 2001).
4. All due precautions will be taken to limit harm to clapper rails by establishing survey routes that incorporate existing roads, levees, and

boardwalks whenever possible and by knowledge of where clapper rails nest and what clapper rail nest look like (Special Terms and Conditions for PRBO Permit 2001).

5. All personnel will keep talking and other noise to a minimum near the marsh to reduce disturbance (USFWS 2016).
6. If California clapper rail nests are encountered, the observers will immediately leave the vicinity of the nest, careful not to disturb the nest in any way. If adult California clapper rail or chicks are encountered, observers will carefully move away from the birds, if they are giving alarm calls or otherwise appear agitated (USFWS 2016).
7. Hazing with pyrotechnics will be used only beyond 250 feet from a known California clapper rail nest.

d) Light-footed Clapper Rail

1. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding rails.
2. If boats are required for marsh access, the speed of the boat will be reduced when approaching the marsh (Special Terms and Conditions for PRBO Permit 2001).
3. Disturbance to rails will be minimized to the maximum extent possible during the breeding season (Special Terms and Conditions for PRBO Permit 2001).
4. All due precautions will be taken to limit harm to Clapper rails by establishing survey routes that incorporate existing roads, levees, and boardwalks whenever possible and by knowledge of where Clapper rails nest and what Clapper rail nest look like (Special Terms and Conditions for PRBO Permit 2001).
5. Hazing with pyrotechnics will be used only beyond 250 feet from a known light-footed Clapper rail nest.

e) Salt Marsh Harvest Mouse

1. Rodent traps are not used within salt marsh harvest mouse habitat.
2. All due precautions will be taken to limit harm to salt marsh harvest mouse by establishing survey routes that incorporate existing roads, levees, and boardwalks whenever possible and by knowledge of where salt marsh harvest mouse reside and the ability to identify the salt marsh mouse.
3. All personnel will keep talking and other noise to a minimum near the marsh to reduce disturbance (USFWS 2016).

f) California Least Tern

1. APHIS-WS abides by restrictions in place to minimize disturbance to nesting terns. For example, if the substrate is extremely hot, or conversely, if ambient temperature is below 65°F, care is taken to ensure that nesting birds do not leave for more than 15 minutes (Elliott *et al*. 2007). APHIS-WS generally avoids entry into the colonies, unless there is a need to

inspect for predation or predator sign, or to remove a particular predator from inside the colony. As often as possible, APHIS-WS attempts to coordinate with the site monitors and enter the colony with them, so as to minimize disturbance. APHIS-WS completes its activities as quickly as possible to reduce disturbance.

2. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding terns.
3. When entering a nesting colony, activities shall be conducted as unobtrusively as possible and with the least amount of disturbance to the colony (Special Terms and Conditions for Point Reyes Bird Observatory (PRBO) Permit 2001). Visits to trap sites near nests will be limited to minimize potential harassment and to minimize attracting other predators. Visits to control sites will be done in cooperation with biologists monitoring the protected nests to best avoid disturbing incubating adult shorebirds.
4. Hazing with pyrotechnics will be used only beyond 250 feet from a known California least tern nest.
5. Pan tension devises shall be adjusted so that the trap is triggered by the weight of a raptor, but not by the weight of a California least tern.

III. Status of the Species

A. Marbled Murrelet (*Brachyrampus mamoratus*)

1. Legal Status

The marbled murrelet was listed as a threatened species on September 28, 1992, in Washington, Oregon, and northern California (57 FR 45328; October 1, 1992). On May 24, 1996, the USFWS designated critical habitat for the marbled murrelet in Washington, Oregon, and California (61 FR 26256). On October 5, 2011, the USFWS published a final rule revising critical habitat for the murrelet (76 FR 61599).

2. Natural History/Biology

Marbled murrelets are long-lived seabirds that spend most of their life in the marine environment, with breeding adult birds annually nesting in the forest canopy of mature and old growth forests. Because of their small body size, cryptic plumage, crepuscular activity, fast flight speed, solitary nesting behavior, and secretive behavior near nests, murrelet nests have been extremely difficult to locate (Hamer and Nelson 1995). Breeding occurs from about March 24 through September 15, is asynchronous, and spread over a more prolonged season than for most temperate seabirds. Marbled murrelets have a naturally low reproductive rate. Marbled murrelets lay just one egg per year(?), and are thought to usually first breed at age 3. Re-nesting in the event of nest failure appears to be uncommon, but does occur (Hebert *et al*. 2003; Piatt *et al*. 2007). Incubation is shared by both sexes with incubation shifts lasting 24 hours and exchanges occurring at dawn (Nelson 1997). Chicks fledge 27-40 days after hatching (Nelson 1997). Flights by adults are made from ocean feeding areas to inland nest sites at all times of the day, but most often at dusk and dawn (Hamer and Cummins 1990; Nelson and Hamer 1995).

Marbled murrelets are known to be opportunistic feeders, diving after small schooling fish and large pelagic crustaceans (euphausiids, mysids, amphipods). They will carry a single energy-dense fish to their chick: typically larger sand lance, immature herring, anchovy, smelt, and occasionally salmon smolts (Carter and Sealy 1987; Burkett 1995; Nelson 1997). Radio marked marbled murrelets in California confirm that breeders forage more closely to nesting habitat once nesting is initiated than non-breeders (Peery *et al*. 2009; Hebert and Golightly 2008).

Throughout most of their breeding range, including the listed range from Washington to California, marbled murrelets use old-growth coniferous forest habitat for nesting and forage in the nearshore marine environments. Nests are not built, but rather the egg is placed in a small depression or cup made in moss or other debris on the limb (USFWS 1997). At the north end of the range, ground-nesting occurs in the Aleutian Islands and parts of southern Alaska. The distance inland that marbled murrelets breed is variable and influenced by a number of factors; however, the USFWS considers 50 miles as the maximum inland distance for determining habitat suitability and amount of habitat within the listed range (USFWS 2009a).

In California, radio-marked marbled murrelets confirmed that breeders forage more closely to nesting habitat once nesting is initiated than non-breeders (Peery *et al*. 2009; Hebert and Golightly 2008). In northern California, mean home range size was 253 square miles (mi^2) for non-nesters and 93 mi^2 for nesters (Hebert and Golightly 2008). Mean along-shore movement was 43 miles for nesting females and 49 miles for nesting males (Hebert and Golightly 2008). Mean offshore movement was within 0.9 mile regardless of sex or nesting status (Hebert and Golightly 2008).

3. Range-wide Status and Distribution

The marbled murrelet is a small seabird that inhabits the coastal forests and nearshore marine environment along the Pacific coast of North America from southern California to southern Alaska and the Aleutian Islands (Carter and Morrison 1992; Ralph *et al*. 1995; Nelson 1997). The breeding range of the marbled murrelet extends along the Pacific coast from Alaska to Monterey Bay in central California. Some wintering birds occur as far south as northern Baja California, Mexico. However, only the Washington, Oregon, and California population segment is federally listed as threatened (USFWS 1992).

Limited information is available on their historical distribution and numbers; however, most summaries give indications that the distribution of marbled murrelet populations was significantly reduced as habitat was removed throughout its range. Populations declined as a result. In some areas, marbled murrelets have been locally extirpated, or only small numbers persist, risking maintenance of the species' distribution. These areas are identified as "areas of concern" (USFWS 1997). The areas include distribution gaps in central California, northwestern Oregon, and southwestern Washington, where very little suitable habitat remains, and what habitat does remain occurs in small, fragmented patches.

Marbled murrelet abundance during the early 1990s in Washington, Oregon, and California was estimated at 18,550 to 32,000 birds (Ralph *et al*. 1995). Based primarily on results from the NWFP's marbled murrelet monitoring program (EM Program), the 2014 marbled murrelet population for Conservation Zones 1 through 5 is estimated at about 21,305 birds (95 percent CI: 17,492-25, 118; Table 2). Combined with the data from Conservation Zone 6 in California (see Environmental Baseline), this gives a range-wide estimate at 21,742, which is slightly lower than in the estimates in 2011 (23,000 birds), but still higher than the 4 years preceding 2011, when estimates were consistently below 18,000 birds (Miller *et al*. 2012).

Throughout the listed range of the murrelet, affected habitat as a result of actions consulted upon through Section 7 of the Endangered Species Acts has been documented by the USFWS since October 2003. Most of the affected habitat is within the Oregon Coast Range (6,628 ac) and Siskiyou Coast Ranges (4,142 ac) with most of the acreage coming from patches of older forest with sufficient nest structure (Table 3).

Table 2. Summary of 2001-2015 marbled murrelet density and population size estimates (rounded to the nearest 100 birds) for Conservation Zones 1-5 combined.

Year	Density (birds/km^2)	Bootstrap Standard Error (birds/km^2)	Coefficient of Variation of Density (%)	Birds	Birds Lower 95% CL	Birds Upper 95% CL
2001	2.47	0.25	10.10%	21,800	17,500	26,100
2002	2.56	0.31	11.90%	22,500	17,300	27,800
2003	2.60	0.25	9.60%	22,800	18,500	27,100
2004	2.46	0.26	10.50%	21,600	17,100	26,000
2005	2.30	0.25	10.70%	20,200	16,000	24,400
2006	2.08	0.17	8.20%	18,300	15,300	21,200
2007	1.97	0.27	13.70%	17,300	12,700	22,000
2008	2.06	0.18	8.90%	18,100	15,000	21,300
2009	1.96	0.21	10.60%	17,300	13,700	20,900
2010	1.89	0.21	11.10%	16,600	13,000	20,300
2011	2.50	0.31	12.60%	22,000	16,600	27,400
2012	2.40	0.27	11.40%	21,100	16,400	25,700
2013	2.24	0.25	11.10%	19,700	15,400	23,900
2014	2.43	0.22	9.10%	21,305	17,492	25,118
2015	Not all Zones were surveyed, do not have an all zones estimate					

Table 3. Aggregate Results of All Suitable Habitat (Acres) Affected by Section 7 Consultation for the Marbled Murrelet; Summary of Effects by Conservation Zone and Habitat Type From October 1st, 2003 to September 7, 2017.

Conservation Zone[1]	Authorized Habitat Effects[2]		Reported Habitat Effects[2]	
	Stands[3]	Remnants[4]	Stands[3]	Remnants[4]
Puget Sound	-112	0	-1	0
Western Washington	-3,051	0	-12	0
Outsize CZ Area in WA	0	0	0	0
Oregon Coast Range	-3,226	-1,050	-2,352	0
Siskiyou Coast Range	-3,830	-84	-228	0
Outside CZ Area in OR	-2	0	0	0
Mendocino	0	0	0	0
Santa Cruz Mountains	0	0	0	0
Outside CZ Area in CA	0	0	0	0
Total	-10,221	-1,134	-2,593	0

1. Conservation Zones (CZ) six zones were established by the 1997 Recovery Plan to guide terrestrial and marine management planning and monitoring for the Marbled Murrelet. *Marbled Murrelet Recovery Plan, September, 1997*
2. Habitat includes all known occupied sites, as well as other suitable habitat, though it is not necessarily occupied. Importantly, there is no single definition of suitable habitat, though the Marbled Murrelet Effectiveness Monitoring Module is in the process. Some useable working definitions include the Primary Constituent Elements as defined in the Critical Habitat Final Rule, or the criteria used for Washington State by Raphael et al. (Condor 104:331-342).
3. Stand: A patch of older forest in an area with potential platform trees.
4. Remnants: A residual/remnant stand is an area with scattered potential platform trees within a younger forest that lacks, overall, the structures for marbled murrelet nesting.

4. Threats

Several threats to marbled murrelets, present in both the marine and terrestrial environments, have been identified. These threats collectively comprise a suite of environmental stressors that, individually or through interaction, have significantly disrupted or impaired behaviors which are essential to the reproduction or survival of individuals. When combined with the species' naturally low reproductive rate, these stressors have led to declines in marbled murrelet abundance, distribution, and reproduction at the population scale within the listed range.

When the marbled murrelet was listed under the Act and threats were summarized in the Recovery Plan (USFWS 1997), the following anthropogenic threats were identified as having caused the dramatic decline in the species:

- habitat destruction and modification in the terrestrial environment from timber harvest and human development caused a severe reduction in the amount of nesting habitat;

- unnaturally high levels of predation resulting from forest "edge effects," as well as elevated predator densities in the vicinity of area of high human use (*e.g*., campground, picnic grounds);
- the existing regulatory mechanisms, such as land management plans (in 1992), were considered inadequate to ensure protection of the remaining nesting habitat and reestablishment of future nesting habitat; and
- man-made factors, such as mortality from oil spills and entanglement in fishing nets used in gill-net fisheries.

There have been changes in the levels of these threats since the 1992 listing (USFWS 2004; USFWS 2009a). The regulatory mechanisms implemented since 1992 that affect land management in Washington, Oregon, and California (for example, the Northwest Forest Plan [NWFP]) and new gill-netting regulations in northern California and Washington have reduced the threats to marbled murrelets (USFWS 2004). The threat levels for the other threats identified in 1992 listing (57 FR 45333), including the loss of nesting habitat, predation rates, and mortality risks from oil spills and gill net fisheries (despite the regulatory changes), remained unchanged following the USFWS's 2004, five-year, range-wide status review for the marbled murrelet (USFWS 2004).

However, new threats were identified in the USFWS's 2009, five-year review for the marbled murrelet (USFWS 2009a). These new stressors are due to several environmental factors affecting marbled murrelets in the marine environment. These new stressors include:

- Habitat destruction, modification, or curtailment of the marine environmental conditions necessary to support marbled murrelets due to:
  - elevated levels of polychlorinated biphenyls in marbled murrelet prey species;
  - changes in prey abundance and availability;
  - changes in prey quality;
  - harmful algal blooms that produce biotoxins leading to domoic acid and paralytic shellfish poisoning that have caused marbled murrelet mortality; and
  - climate change in the Pacific Northwest.

- Man-made factors that affect the continued existence of the species include:
  - derelict fishing gear leading to mortality from entanglement;
  - energy development projects (wave, tidal, and on-shore wind energy projects) leading to mortality; and
  - disturbance in the marine environment (from exposures to lethal and sub-lethal levels of high underwater sound pressures caused by pile-driving, underwater detonations, and potential disturbance from high vessel traffic).

5. Conservation and Recovery

The *Recovery Plan for the Marbled Murrelet (Washington, Oregon, and California Populations)* identified six Conservation Zones throughout the listed range of the species: Puget Sound (Conservation Zone 1), Western Washington Coast Range (Conservation Zone 2), Oregon Coast Range (Conservation Zone 3), Siskiyou Coast Range (Conservation Zone 4), Mendocino (Conservation Zone 5), and Santa Cruz Mountains (Conservation Zone 6). Recovery zones are the functional equivalent of recovery units as defined by USFWS policy (USFWS 1997).

The Recovery Plan (USFWS 1997) also identified specific actions as necessary to stabilize the population include protecting occupied habitat and minimizing the loss of unoccupied but suitable habitat. Specific actions include maintaining large blocks of suitable habitat, maintaining and enhancing buffer habitat, decreasing risks of nesting habitat loss due to fire and windthrow, reducing predation, and minimizing disturbance. Long-term conservation needs identified in the plan include:

- increasing productivity (abundance, the ratio of juveniles to adults, and nest success) and population size;
- increasing the amount (stand size and number of stands), quality, and distribution of suitable nesting habitat;
- protecting and improving the quality of the marine environment; and
- reducing or eliminating threats to survivorship by reducing predation in the terrestrial environment and anthropogenic sources of mortality at sea.

6. Critical Habitat

On August 4, 2016, the USFWS determined that critical habitat for the murrelet as designated in 1996 and revised in 2011 meets the statutory definition of critical habitat under the Act (81 FR 51348). The current designation includes 3,698,100 acres of critical habitat in Washington, Oregon, and California. The USFWS published the recovery plan for the marbled murrelet in September 1997 (USFWS 1997).

B. Western Snowy Plover (*Charadrius alexandrinus nivosus*)

1. Legal Status

The USFWS listed the Pacific coast population of the western snowy plover as threatened on March 5, 1993 (58 FR 12864). We designated critical habitat in 1999 (64 FR 68508 68544) and re-designated it in 2005 (70 FR 56970 57119). In 2012, we issued a revised critical habitat designation, which included a change in taxonomic nomenclature (77 FR 36727 36869). We completed a five-year status review in 2006 (USFWS 2006b), and issued a recovery plan in September 2007 (USFWS 2007).

2. Natural History/Biology

The western snowy plover is a small shorebird in the family Charadriidae, a subspecies of the snowy plover (*Charadrius nivosus*). It is pale gray-brown above and white below, with a white collar on the hind neck and dark patches on the lateral breast, forehead, and behind the eyes. The bill and legs are black.

<u>Foraging Behavior</u>
Western snowy plovers are primarily visual foragers, using the run-stop-peck method of feeding typical of most plover species. They forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry sand areas above the high tide, on saltpans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. They sometimes probe for prey in the sand and pick insects from low-growing plants (USFWS 2007).

<u>Breeding</u>
The Pacific coast population of the western snowy plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. The main coastal habitats for nesting include sand spits, dune-backed beaches, beaches at creek and river mouths, and saltpans at lagoons and estuaries (Page and Stenzel 1981; Wilson 1980). Western snowy plovers nest less commonly on bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and gravel river bars (Wilson 1980; Page and Stenzel 1981; Powell *et al*. 2002; Tuttle *et al*. 1997).

Their nests consist of a shallow scrape or depression, sometimes lined with beach debris (*e.g*., small pebbles, shell fragments, plant debris, and mud chips). As incubation progresses, western snowy plovers may add to and increase the nest lining. Driftwood, kelp, and dune plants provide cover for chicks that crouch near objects to hide from predators. Because invertebrates often occur near debris, driftwood and kelp are also important for harboring snowy plover food sources (Page *et al*. 2009).

Along the west coast of the United States, the nesting season of the western snowy plover extends from early March through late September. Generally, the breeding season may be 2 to 4 weeks earlier in southern California than in Oregon and Washington. Fledging (reaching flying age) of late-season broods may extend into the third week of September throughout the breeding range (USFWS 2007).

The approximate periods required for snowy plover nesting events are: 3 days to more than a month for scrape construction (in conjunction with courtship and mating), usually 4 to 5 days for egg laying, and incubation averaging 28.4 days in the early season (before May 8) to 26.9 days in the late season (Warriner *et al*. 1986). The usual clutch size is three eggs with a range from two to six (Page *et al*. 2009). Both sexes incubate the eggs, with the female tending to incubate during the day and the male at night (Warriner *et al*. 1986). Adult western snowy plovers frequently will attempt to lure people and predators from hatching eggs and chicks with alarm calls and distraction displays.

Western snowy plover chicks are precocial, leaving the nest with their parents within hours after hatching (USFWS 2007). They are not able to fly for approximately 1 month after hatching; fledging requires 29 to 33 days (Warriner *et al*. 1986). Broods rarely remain in the nesting area until fledging (Warriner *et al*. 1986; Lauten *et al*. 2010). Casler *et al*. (1993) reported broods would generally remain within a 1-mile radius of their nesting area; however, in some cases would travel as far as 4 miles.

<u>Wintering</u>
In winter, western snowy plovers are found on many of the beaches used for nesting, as well as beaches where they do not nest. They also occur in man-made salt ponds and on estuarine sand and mud flats. In California, the majority of wintering western snowy plovers concentrate on sand spits and dune-backed beaches. Some also occur on urban and bluff-backed beaches, which they rarely use for nesting (Page *et al*. 1986; Page and Stenzel 1981). South of San Mateo County, California, wintering western snowy plovers also use pocket beaches at the mouths of creeks and rivers on otherwise rocky Page *et al*. 1986). Snowy plovers forage in loose flocks. Roosting snowy plovers will sit in depressions in the sand made by footprints and vehicle tracks, or in the lee of kelp, driftwood, or low dunes in wide areas of beaches (Page *et al*. 2009). Sitting behind debris or in depressions provides some shelter from the wind and may make the birds more difficult for predators to detect.

3. Range-wide Status and Distribution

Historical records indicate that nesting western snowy plovers were once more widely distributed and abundant in coastal Washington, Oregon, and California (USFWS 2007). In Washington, western snowy plovers formerly nested at five coastal locations (Washington Department of Fish and Wildlife 1995) and at over 20 sites on the coast of Oregon (USFWS 2007). In California, by the late 1970s, nesting western snowy plovers were absent from 33 of 53 locations with breeding records prior to 1970 (Page and Stenzel 1981).

The first quantitative data on the abundance of western snowy plovers along the California coast came from window surveys conducted during the 1977 to 1980 breeding seasons by Point Reyes Bird Observatory (Page and Stenzel 1981). Observers recorded an estimated 1,593 adult western snowy plovers during these pioneering surveys. The results of the surveys suggested that the western snowy plover had disappeared from significant parts of its coastal California breeding range by 1980 (USFWS 2007).

Breeding season and winter window survey data from 2005 to 2017 includes approximately 250 sites in Washington, Oregon, and California, with the majority of the sites located in California. In California, 1,807 western snowy plovers were counted during the 2016 breeding window survey, and 3,802 western snowy plovers were counted during the 2016-2017 winter window survey (Arcata Fish and Wildlife Office (AFWO) 2016, 2017). Across the Pacific coast range, the 2016 breeding window survey estimated 2,284 western snowy plovers, and the 2016-2017 winter window survey estimated 4,214 western snowy plovers in Washington, Oregon and California (AFWO 2016, 2017). These numbers demonstrate that a large percentage of all western snowy plovers in the Pacific coast range were counted in California during both winter and breeding window surveys. In a 2014 western snowy plover population viability analysis, Hudgens *et al*. (2014) suggest that sites south of Point Reyes National Sea Shore in California are expected to be population sources for sites in the higher latitudes of the Pacific coast range.

4. Threats

Historical records indicate that nesting western snowy plovers were once more widely distributed and abundant in coastal Washington, Oregon, and California. The reasons for decline and degree of threats vary by geographic location; however, the primary threat was, and remains, habitat destruction and degradation. Habitat loss and degradation can be primarily attributed to human disturbance, urban development, introduced beachgrass (*Ammophila* spp.), and expanding predator populations (USFWS 2007). Natural factors, such as inclement weather, have also affected the quality and quantity of western snowy plover habitat (58 FR 12865).

5. Recovery

The primary objective of the recovery plan (USFWS 2007) is to remove the Pacific coast population of the western snowy plover from the list of endangered and threatened wildlife and plants by:

1. Increasing population numbers distributed across the range of the Pacific coast population of the western snowy plover;

2. Conducting intensive ongoing management for the species and its habitat and developing mechanisms to ensure management in perpetuity; and

3. Monitoring western snowy plover populations and threats to determine success of recovery actions and refine management actions.

The Pacific coast population of the western snowy plover would be considered for delisting when the following criteria have been met (USFWS 2007):

1. An average of 3,000 breeding adults has been maintained for 10 years, distributed among 6 recovery units (Figure 2) as follows: Washington and Oregon, 250 breeding adults; Del Norte to Mendocino Counties, California, 150 breeding adults; San Francisco Bay, California, 500 breeding adults; Sonoma to Monterey Counties, California, 400 breeding adults; San Luis Obispo to Ventura Counties, California, 1,200 breeding adults; and Los Angeles to San Diego Counties, California, 500 breeding adults. This criterion also includes implementing monitoring of site-specific threats, incorporation

of management activities into management plans to ameliorate or eliminate those threats, completion of research necessary to modify management and monitoring actions, and development of a post-delisting monitoring plan.

2. A yearly average productivity of at least one (1.0) fledged chick per male has been maintained in each recovery unit in the last 5 years prior to delisting.

3. Mechanisms have been developed and implemented to assure long-term protection and management of breeding, wintering, and migration areas to maintain the subpopulation sizes and average productivity specified in Criteria 1 and 2. These mechanisms include establishment of recovery unit working groups, development and implementation of participation plans, development and implementation of management plans for federal and state lands, protection and management of private lands, and public outreach and education.

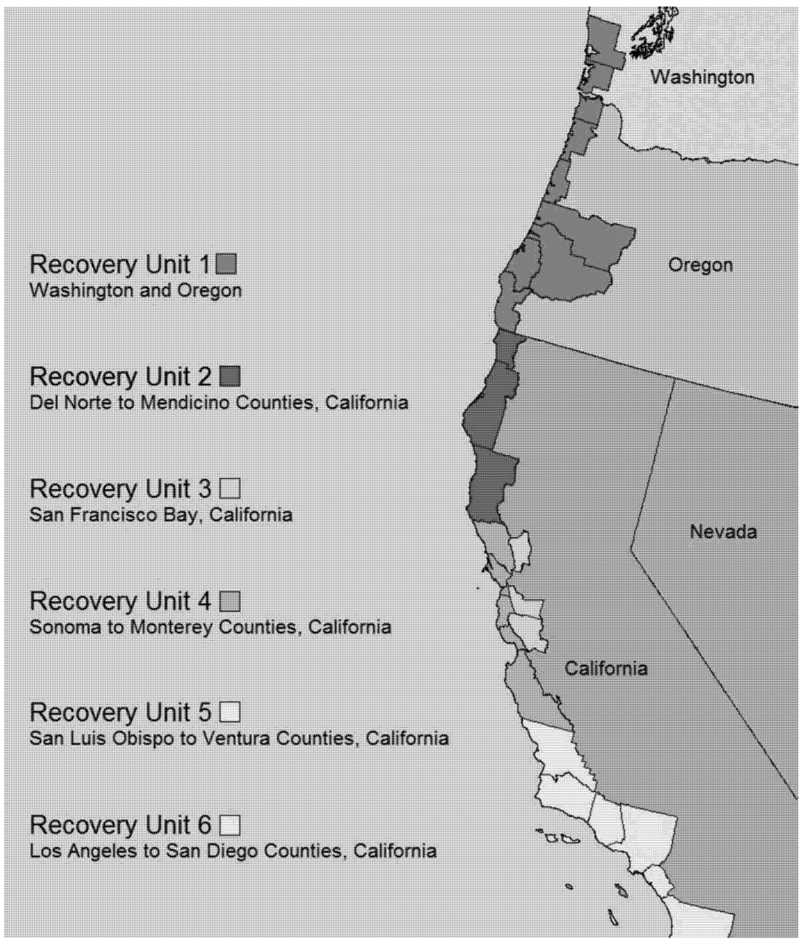


Figure 2. Range of U.S. Fish and Wildlife Service Recovery Units for the federally threatened Pacific coast population of the western snowy plover.

6. Critical Habitat

On June 19, 2012, the final rule determining critical habitat for the western snowy plover was published in the Federal Register (USFWS 2012b). The rule identifies approximately 24,527 acres of critical habitat units in Washington, Oregon, and California. In California, a total of 47 units on 16,337 acres throughout northern and southern California coastal areas were designated. Within designated critical habitat, primary constituent elements (PCEs) for western snowy plover were identified as providing the physical or biological features essential to the conservation of the species (USFWS 2012b). The primary constituent elements (PCEs) essential to the conservation of the western snowy plover are 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. Specifically, PCEs consist of the following:

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 PCE 2 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 or normal behavior.

C. California Clapper Rail (*Rallus longirostris obsoletus*)

1. Legal Status

The California Clapper rail (*Rallus obsoletus beldingi*) was federally listed as endangered in 1970 (35 FR 16047). The California Clapper rail is a Fully Protected Species under California law (California Fish and Game Code §3511).

2. Natural History/Biology

This subspecies is one of three in California listed as endangered under the Endangered Species Act (Act). The other subspecies are the light-footed Clapper rail (*R. l. levipes*), which is found in tidal marshes in southern California and northwestern Baja California, and the Yuma Clapper rail (*R. l. yumanensis*), which is restricted to the Colorado River Basin. A detailed account of the taxonomy, ecology, and biology of the California Clapper rail can be found in the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b).

California Clapper rails occur almost exclusively in tidal salt and brackish marshes with unrestricted daily tidal flows, adequate invertebrate prey food supply, well-developed tidal channel networks, and suitable nesting and escape cover for refuge during extreme tides. They exhibit strong site fidelity and territorial defense and are considered sensitive to disturbance. They tend to have relatively small average home ranges of 4.7 hectares (11.6 acres) and core use areas of 0.9 hectares (2.2 acres).

3. Range-wide Status and Distribution

A five-year review was completed in 2013 (USFWS 2013a). Historically, the California Clapper rail was abundant in all tidal salt and brackish marshes in the San Francisco Bay vicinity, as well as in all of the larger tidal estuaries from Marin to San Luis Obispo counties. Current distribution is restricted almost entirely to the marshes of the Bay Area and where the only known breeding populations occur (Figure 3).

California Clapper rail population numbers have generally fluctuated over time and have never improved to a level warranting consideration for upgrading the status of the species since its original listing as endangered in 1970. Citing various sources, the 2013 five-year review of the California Clapper rail reported a population estimated at 4,200 to 6,000 birds between 1971-1975, at only 1,500 birds between 1981-1987, and reaching an estimated all-time historical low of about 500 birds in 1991. The five-year review noted that California Clapper rail numbers have rebounded slightly since the early 1990s, but that substantial increases in population may be difficult to achieve due to the current disjunct distribution of their habitat (USFWS 2013a).

The Invasive Spartina Project (ISP), a multi-partner, regional non-native Spartina control program, conducts annual San Francisco Bay Estuary-wide California Clapper rail surveys at program-associated sites. Annual ISP California Clapper rail surveys at 30 sites across the estuary from 2005-2010 showed an increase from 80 birds in 2005, to 140 birds in 2007, before declining to below 60 birds in 2010 (McBroom *et al.* 2011). The ISP has expanded the number of sites included in its rail surveys, and for 158 sites across the estuary from 2010-2015, the project reported fluctuating numbers with 577 rails in 2010, a low of 498 in 2013, and a rebound to 670 birds in 2015 (McBroom 2015).

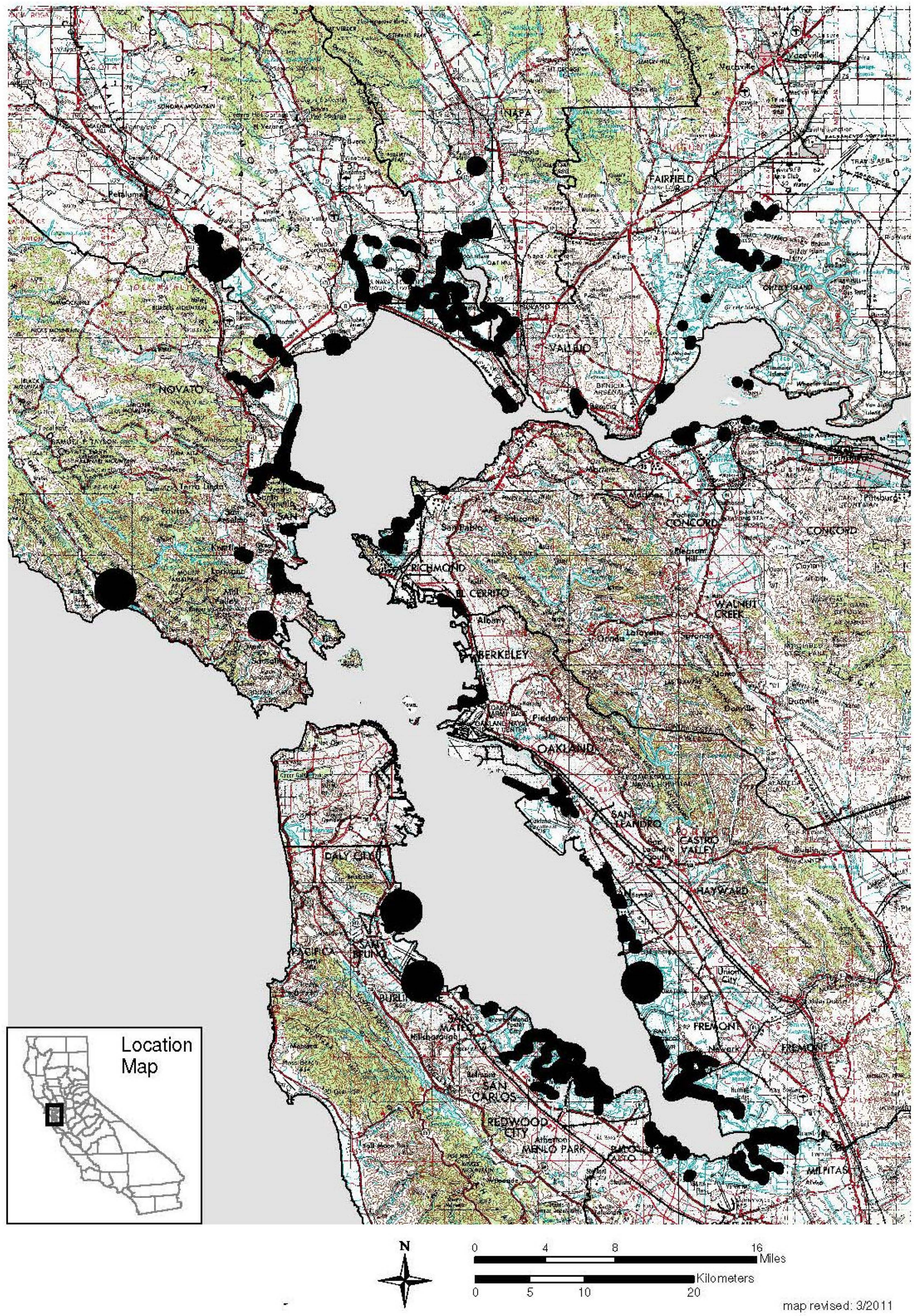


Figure 3. Known current distribution of California clapper rail.

4. Threats

Threats to the species include, but are not limited to, habitat destruction and modification, low adult survivorship (ranging from 0.49 to 0.52), and predation of adults and eggs/nestlings (USFWS 2013b).

5. Recovery

Recovery of California clapper rails requires a combination of interim and long-term actions. Interim actions are those necessary to maintain current populations, while long-term actions focus on recovering the species throughout its range. Interim actions involve monitoring current populations (number and distribution), non-native predator and invasive plant control, reducing human disturbance and protection of existing habitat. Long-term actions involve large-scale tidal marsh restoration and implementation of long-term management plans.

6. Critical Habitat

Critical habitat has not been proposed or designated.

D. Light-footed Clapper Rail (*Rallus longirostris levipes)*

1. Legal Status

The light-footed clapper rail was listed as endangered in October 1970 (35 FR 16047). A recovery plan was adopted in 1977 and revised in 1985 (USFWS 1985b). The light-footed clapper rail is a fully protected species under California law (see California Fish and Game Code, Section 3511). Detailed information on the status of the species can be found in the recovery plan for the rail (USFWS 1985b) and the five-year review for the rail (USFWS 2009b).

2. Natural History/Biology

The light-footed clapper rail is found in salt marshes/tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Density of nests is typically highest in tall cordgrass, and the largest numbers of light-footed clapper rails are in marshes with the most cordgrass. This species requires a healthy salt marsh environment with the correct vegetation for nesting, abundant food in the form of crabs and invertebrates, and tidal flats interspersed with vegetation for foraging. These conditions are found in salt marshes with tidal influence sufficient to maintain a normal salinity range and prevent stagnation. If suitable habitat is present, other factors seem to have little influence on light-footed clapper rail numbers, as predation by itself is seldom limiting, and light-footed clapper rails are generally tolerant of human activity if it does not result in habitat degradation.

Light-footed clapper rails nest in the densest vegetation available. The nest is typically built on high ground in a salt marsh to prevent flooding of the nest by high tides, and concealed in tall vegetation for protection from predators. If nesting in cordgrass, the nest may be placed above the ground, while nests in pickleweed areas may be placed directly on the ground. Nests are constructed with whatever vegetation is available and are usually somewhat buoyant. Nesting in most areas begins by mid-March and concludes in July. Both sexes incubate the eggs, which number from 5 to 11, and hatching occurs in approximately 23 days. The young are precocial and are able to swim on the day of hatching. Some pairs may have two broods in a season.

3. Range-wide Status and Distribution

Updated information on species' numbers and distribution, threats and conservation needs is summarized below to provide context to this biological opinion and is generally taken from the five-year review for the rail (USFWS 2009b).

The rail occurs mostly in salt marsh habitat in California, ranging from Ventura County in the north to the Mexican border in the south. When annual statewide rail censuses began in 1980, 203 pairs of rails were detected within 11 coastal wetlands surveyed (USFWS 2009b). Since 1980, the lowest number of pairs detected was 142 in 1985 when 14 coastal wetlands were surveyed (USFWS 2009b). The highest number of pairs detected was 656 in 2016 when the census surveyed 18 coastal wetlands (Zembal et. al 2017). Approximately 91 percent of the rail pairs counted in 2016 was found in only 9 of the 18 coastal wetlands surveyed. These coastal wetlands include, from north to south, Mugu Lagoon, Seal Beach National Wildlife Refuge, Upper Newport Bay, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Peñasquitos Lagoon, Kendall-Frost Mission Bay Marsh Reserve, and Tijuana Slough National Wildlife Refuge. Rails have been documented in two coastal wetlands in Baja California, Mexico (Zembal and Palacios 1994); however, the status of the rail in Mexico is not well documented and an abundance estimate is unavailable (USFWS 2009b).

More recently, rails have also been increasingly observed in freshwater/brackish marsh at the San Diego River (Zembal *et al*. 2008), San Dieguito River, San Elijo Lagoon, Los Penasquitos Lagoon, Buena Vista Lagoon and Creek, Batiquitos Lagoon, Agua Hedionda Lagoon, San Luis Rey River, Santa Margarita River, and Sweetwater River (Zembal *et al*. 2017).

While the 2017 annual statewide census is not complete, surveying biologists suspect population losses in some locations, including the two largest populations at Newport Bay and Tijuana Estuary (Collins 2017, pers. comm.). Newport Bay experienced a significant cordgrass stand die-off, which may have resulted from elevated sea surface levels related to the El Nino Southern Oscillation. Tijuana Estuary has experienced three river mouth closure events over the past year, the first of which resulted in anoxic conditions in the estuary, resulting in significant negative effects on rail forage species, and presented an extended elevated water level period for rails that may have left the population vulnerable to higher predation rates (Collins 2017, pers. comm.). The third largest population of rails is located at the San Elijo Lagoon (Zembal et. al 2016).

4. Threats

Early records indicate that the light-footed clapper rail was hunted heavily for sport and food; however, the species' decline is attributed almost entirely to habitat loss, as approximately 93 percent of salt marsh habitat in California has been lost to development (USFWS 1985b). Contaminants, particularly pesticides and heavy metals, in salt marshes may be contributing to declines of the light-footed clapper rail in otherwise suitable habitat. At the current time, small population sizes, isolation, and habitat quality are the predominant factors limiting rail abundance. Progress has been made to increase the number of rails since listing, and regulatory mechanisms have been successful at stopping destruction and degradation of marsh lands. Conservation efforts have included habitat restoration, installing artificial nesting platforms, captive breeding and translocation, predator control, and annual range-wide censuses. However, in its best year since listing, the rail population was only 82 percent of the way to the 800 pairs suggested by the recovery plan for downlisting despite these conservation efforts. Therefore, the rail continues to meet the definition of endangered, and no change in listing status was made following our five-year review (USFWS 2009b).

5. Recovery

The USFWS completed a recovery plan for the light-footed clapper rail in 1979 and revised the plan in 1985 (USFWS 1985b). The goal of the recovery plan is to downlist the light-footed clapper rail to threatened status. The recovery plan is skeptical that full recovery can be achieved given the extent of seemingly irreversible habitat loss that has occurred; however, the plan states that, after downlisting, "it may be possible to devise additional actions that when implemented may warrant considering the light-footed clapper rail for delisting (page 22)." The primary components of the species' recovery are restoring suitable coastal marsh habitat, protecting all remaining suitable habitat, and managing this habitat for the benefit of the light-footed clapper rail.

The recovery plan specifies that the light-footed clapper rail may be considered for downlisting when:

1. The breeding population of light-footed clapper rails in California is at least 800 pairs;
2. Approximately 10,000 acres of suitably managed wetland habitat are adequately protected; and
3. The protected habitat consists of at least 50 percent of marsh vegetation suitable for light-footed clapper rails in at least 20 marsh complexes.

Light-footed clapper rail five-year status review

The USFWS completed a five-year status review for the light-footed clapper rail in 2009 (USFWS 2009b) and reported that downlisting criteria 1 (population size of at least 800 pairs), and 2 (at least 10,000 acres of protected habitat) have not been met. The five-year review documents some loss of coastal salt marsh habitat since listing, but acknowledges that state and federal laws will likely prevent major habitat loss due to development in the future. The five-year review notes that conservation actions including habitat restoration, opening wetlands to full tidal influence, artificial nest placement, and captive breeding/translocation to augment smaller populations of light-footed clapper rails have occurred to benefit the species. While the species' population numbers had been improving, there was a dramatic decrease in the light-footed clapper rail populations at two of the largest colonies in California from 2007 to 2008 (in the years following completion of the five-year review, this population decline appears to have been reversed (California Department of Fish and Game 2012)). The five-year review concludes that substantial threats to the light-footed clapper rail remain including indirect effects to habitat (*e.g.*, siltation, contaminants); the small amount of habitat remaining for the species to occupy; genetic consequences of small, isolated populations; automobile strikes; and climate change. Therefore, the five-year review recommended that the USFWS maintain the species' endangered status.

6. Critical Habitat

No critical habitat has been designated for this species.

E. Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*)

1. Legal Status

The salt marsh harvest mouse (*Reithrodontomys raviventris*) was federally listed as endangered in 1970 (35 FR 16047). The listing at the species level includes two subspecies: the northern salt marsh harvest mouse (*R. r. halicoetes*), found in San Pablo and Suisun Bays, and the salt marsh harvest mouse (*R. r. raviventris*), found in the marshes of Corte Madera, Richmond, and South San Francisco Bay.

The salt marsh harvest mouse is a Fully Protected Species under California law (California Fish and Game Code §4700).

2. Natural History/Biology

The salt harvest mouse is restricted to saline (salty) or brackish (somewhat salty) marsh habitats, with a *Sarcocornia*-dominated (pickleweed) marsh plain middle zone, as well as and a high marsh zone being important features. Telemetry studies found mean home ranges to be approximately 0.21 hectare (0.52 acre) for the northern subspecies and approximately 0.15 hectare (0.37 acre) for the southern subspecies (USFWS 2010). Shellhammer (2009 in USFWS 2010) identified that generally salt marsh harvest mice do not cross large areas of open habitat (*i.e*., open space or unvegetated habitat). A detailed account of the taxonomy, ecology, and biology of the salt marsh harvest mouse can be found in the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b).

3. Range-wide Status/Distribution

Data are limited for estimating historical rangewide population and distribution. The salt marsh harvest mouse probably occupied most of the middle tidal, or *Sarcocornia* -dominated (pickleweed), marsh plains and high marsh zones of San Francisco Bay, San Pablo Bay, and Suisun Marsh prior to the significant marsh reclamation of the 1840s. However, by the time of listing, it is likely that populations of the species rangewide had fallen to low levels (USFWS 2010).

Survey data for the species is generally sparse, with most surveys having been site-specific and relatively short term. For the northern population, the fringing salt marshes along northern San Pablo Bay (Petaluma River to Mare Island Strait), particularly the Highway 37/Mare Island Marsh and additional tidal/microtidal marshes, do support fluctuating populations of salt marsh harvest mice. Due to its large size and deep (broad) suitable salt marsh habitat, Suisun Marsh is an important site for the northern subspecies population and may contain the largest population for the species in the entire remaining range (USFWS 2010). Standardized annual surveys conducted there since 1997 by California Department of Fish and Wildlife (CDFW) and California Department of Water Resources, have demonstrated fluctuations, but have shown high and increasing capture efficiencies of 10.0-11.5%, which indicates the population may be increasing (Barthman-Thompson 2010 in USFWS 2010). Surveys at other sites in the northern population's range have demonstrated similar capture efficiencies (Barthman-Thompson pers. comm. 2016). Similarly, recent research about demography and habitat use in Suisun Marsh (Sustaita *et al*. 2011) captured 1,191 individual salt marsh harvest mice in 28,104 trap nights, for an estimated density of 2.5-3.4 mice/hectare.

In general, the status of the southern population is currently considered to be more precarious than the northern population. Few major, resilient, or secure populations persist and those that do are very small and isolated compared with the historical pattern of distribution and abundance (USFWS 2010). Studies by Shellhammer (2005 in USFWS 2010) indicate that population size is generally correlated with the depth of the *Sarcocornia* plain (*i.e*., the middle zone of tidal marshes). Shellhammer further noted that most of the marshes of the South San Francisco Bay are strip-like marshes and, as such, support few salt marsh harvest mice.

4. Threats

The most fundamental reason for the decline of the salt marsh harvest mouse is loss of habitat through filling (*i.e.,* destruction), subsidence, and vegetation change (USFWS 1984, Bias and Morrison 1993, Shellhammer 2000). Predation has also been identified as an influential threat (USFWS 2013b).

5. Recovery

The basic strategy for recovery of the salt marsh harvest mouse is the protection, enhancement, and restoration of extensive, well-distributed habitat suitable for the species. There are short- and long-term components of the general recovery strategy, as well as specific geographic elements. Both interim and long-term components are necessary; neither alone is sufficient to recover the salt marsh harvest mouse. We have identified 5 recovery units: Suisun Bay Area, San Pablo Bay, Central/South San Francisco Bay, Central Coast, and Morro Bay. Recovery criteria comprise a combination of numerical *demographic* targets and measures that must be taken to directly ameliorate or eliminate threats to the species in the appropriate subset of the above recovery units.

6. Critical Habitat

Critical habitat has not been proposed or designated.

F. California Least Tern (*Sterna antillarum browni*)

1. Legal Status

The USFWS listed the California least tern as endangered on June 2, 1970 (35 FR 8491 8498), and is a fully protected species under California law (California Fish and Game Code, Section 3511). We issued a revised recovery plan for the species in 1985 (USFWS 1985a).

2. Natural History

California least terns forage in nearshore oceans, harbors, marina channels, tidal estuarine channels, and sheltered shallow bays (Atwood and Kelly 1984). Adults forage mostly within 2 mi of breeding colonies, and at many sites foraging is primarily in nearshore ocean waters less than 60 ft deep (USFWS 1985a). They feed on small fish that they catch by plunging into the water from flight. In a study of fish dropped by California least tern at 10 nesting areas, researchers found 49 species of fish, all individuals less than 1 year old. Northern anchovy (*Engraulis mordax*) and silverside species (*Atherinidae*) represented 67 percent of the total sample (Atwood and Kelly 1984).

California least terns are migratory colonial nesters, usually arriving in breeding areas by late April and departing again in August (Massey 1974). After the initial nesting period that begins on their arrival in April, a second wave of nesting may occur from mid-June to early August. These are mainly re-nests after initial failures and second-year birds nesting for the first time (Massey and Atwood 1981).

Nesting California least terns usually occupy a sand-shell beach relatively free of plant growth (Massey 1974). The nest is typically a shallow, round depression, constructed by a bird sitting and kicking its feet backwards while rotating its body. This may occur several times before an egg is laid (Massey 1974; Wolk 1974). Terns may use "sideways building" after scrape construction, which consists of the sitting bird reaching out with its bill to pick up additional nest material, such as small shells and shell fragments, and depositing them into the nest (Wolk 1974).

Early in the breeding season, California least terns display night roosting behavior. Prior to incubation, terns will sleep at night at varying distances from the nesting sites. Once incubation begins, birds roost at night on the nest. Terns use roosting sites away from breeding colonies prior to egg laying, apparently for predator avoidance. By not sleeping within the colony until eggs are laid, the terns may delay the colony being discovered by a nocturnal predator by 2 to 3 weeks (USFWS 1985a).

California least terns begin incubation after laying the first egg. Both parents participate in incubation, which lasts 20 to 25 days (Massey 1974). Clutch size ranges from one to three eggs, with two eggs being most common (Massey 1974; Ehrlich *et al*. 1988).

Least tern chicks are semi-precocial (capable of a high degree of independent activity from birth) and are fed small fish by parents within hours of hatching (Massey 1974; Ehrlich *et al*. 1988). Chicks will begin leaving the nest in one to two days (Massey 1974) and fledge at approximately 20 days. Juveniles and adults will fish, loaf, preen, and roost together for several weeks after fledging; adults will continue to feed juveniles during this period (Massey 1974).

California least terns leave nesting areas by August to spend winter months along the west coast of Baja California, the west coast of Mexico, and further south, possibly from the Gulf of California to Guatemala (American Ornithologists' Union (AOU) 1957; USFWS 1985a; Thompson *et al*. 1997).

3. Range-wide Status and Distribution

Least terns nest along the California coast and the Pacific coast of the Baja California Peninsula, Mexico (Figure 4). Approximately 98 percent of breeding least terns nest in the United States, and a small percentage nest in Baja California, Mexico. Known nesting areas range from the northernmost in the San Francisco Bay and Delta area to the southernmost at the mouth of the Tijuana River near the United States–Mexico border (Marschalek 2007). Least terns are most abundant in Los Angeles, Orange, and San Diego Counties, and 75% of the population occurred in these counties in 2016 (Figure 5). On the Baja California Peninsula, least terns nest at sites from Ensenada de la Paz in the north to San José del Cabo in the south (Patten and Erickson 1996).

Wintering grounds remain poorly described, but include coastal mainland Mexico, Guatamala, Baja California, Costa Rica, and possibly Peru (Atwood and Minsky 1983, Massey 1981, Howell and Webb 1995, Vaucher 1988, Ridgely and Gwynne 1989, Stiles and Skutch 1989, Schulenberg *et al.* 1987).

The least tern population has not been intensively studied in Mexico, however surveys of the Pacific coast of the Baja California Peninsula between 2006 and 2008 did document breeding activity at eight colonies estimating 261 adults and 141 nests (Rosemartin and Van Riper III 2012).

U.S. surveys from 1971 to 1973 found 624 pairs of least terns at 19 nesting areas in California (Bender 1974). As conservation measures were implemented throughout the 1970s, 1980s, and into the 1990s, the number of least terns increased, peaking at an estimated 7,100 least tern pairs in 2009 (Marschalek 2010). An abundant food supply and active conservation measures, particularly predator management, likely contributed to the observed population growth. Between 2010 and 2016, there was a significant decline in the number of least terns observed. The estimated number of least terns decreased to 6,437 pairs in 2010 (Marschalek 2011), and by 2016 had dropped to estimated 3,989 to 4,661 pairs (Frost 2017) - just over half of the 2010 population estimate. The cause of the population decline appears to be reduced productivity, which had been reported beginning in approximately 2001 (Figure 6).

4. Threats

At the time of listing, scientists recognized destruction and degradation of nesting habitat as two of the primary threats facing the California least tern (Craig 1971). While many least tern nest sites are now afforded protection, some remain vulnerable to destruction associated with development pressure, and many suffer degradation as a result of close proximity to urbanization (USFWS 2006c). Threats identified in the 2006 review include coastal development, human population growth, and intensified use of beaches, which increase the potential for human activities and disruption in the vicinity of nest sites. The best available scientific and commercial data indicate that the magnitude of these threats will continue to increase as the population in California continues to grow. In addition, climate change, changes in vegetation cover on nesting sites, limited food availability, and predation can result in direct and indirect impacts to the least tern.

Figure 4. U.S. nesting areas of the California least tern (*Sternula antillarum browni*), 2016. Multiple nest sites may be used within the depicted nesting areas.

Figure 5. 2016 Distribution of California least tern (*Sternula antillarum browni*) nesting pairs by region. Data derived from minimum pair estimates in Frost 2016. Southern California includes San Diego, Orange, and Los Angeles Counties.

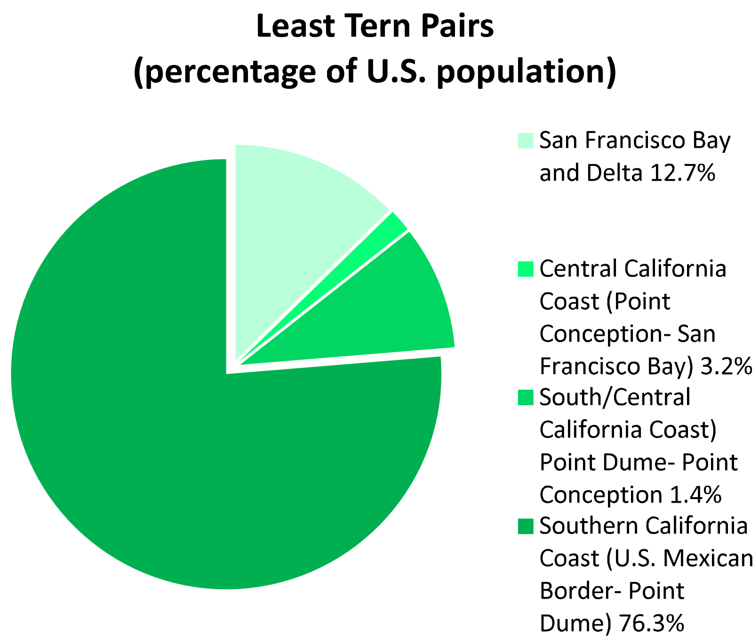
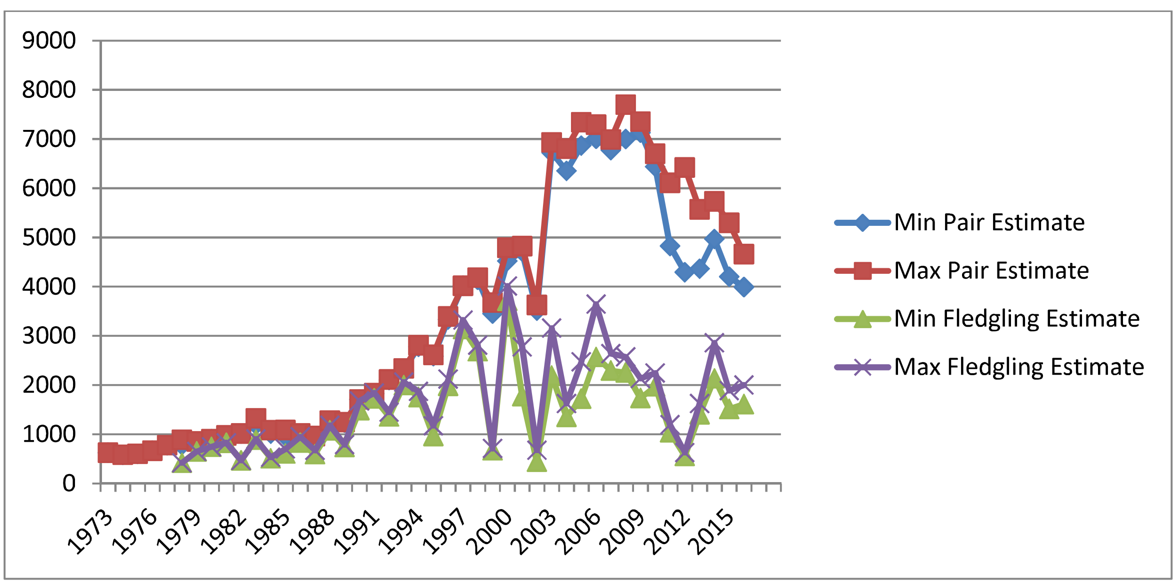


Figure 6. Minimum and maximum estimations of breeding pairs and fledglings produced for the California least tern (*Sternula antillarum browni*) in the United States [1].



[1] **Note:** Statewide surveys with unified methods began in 1973; reliable chick counts began in 1978. Data are from CDFW annual reports (Bender 1974a, 1974b; Massey 1975; Atwood *et al.* 1977; Bender *et al.* 1977; Atwood *et al.* 1979; Gustafson 1986; Collins 1984; Collins 1986; Collins 1987; Massey 1988, 1989; Johnston and Obst 1992; Obst and Johnston 1992; Caffrey 1993, 1994, 1995, 1997, 1998; Keane 1998, 2000, 2001; Patton 2002; Marschalek 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012; Frost 2013, 2014, 2015, 2016).

In the five-year status review, we include a 5-factor analysis of threats, conservation measures, and regulatory mechanisms. To summarize, degraded habitat throughout the range with competing human activities continue to threaten California least tern, and colonies continue to require intensive management. Within these managed sites, the California least tern remains vulnerable to predation, invasive non-native plants, and human-related disturbance. Without continued intensive management, we anticipate that the threats of habitat loss and predation would diminish population gains seen since listing (USFWS 2006c).

Our recommendation in the five-year status review was that the California least tern be reclassified from endangered to threated due to some reduction of impacts of threats and increase in population, recognizing that threats had not been reduced to the point that California least terns would be secure without intensive, site-specific management. We also recommended revisiting the recovery plan, continued management and monitoring of nesting sites, creation of new sites, and expansion of existing sites (USFWS 2006c).

Additionally, since the issuance of the five-year status review, studies and observations continue to see the effects of lower forage fish supply and reduced numbers of breeding pairs and productivity due to El Niño Southern Oscillation Events. With larger storms and tides, loss of breeding areas and washed out nests are likely increase in the future.

5. Recovery

The primary goals outlined in the 1985 recovery plan are to prevent extinction and return the California least tern population to a stable, non-endangered status. We state that reclassification to threatened status may be considered if 1,200 breeding pairs in California occur in 15 secure management areas with a 3-year mean reproduction rate of 1.0 (one fledgling per breeding pair) (USFWS 1985a). We also state that delisting may be considered if the population reaches 1,200 breeding pairs distributed in at least 20 of 23 coastal management areas with the following provisions:

- Sufficient habitat to support at least one viable colony (consisting of a minimum of 20 breeding pairs with a five-year mean reproductive rate of at least 1.0 young fledged per year, per breeding pair) at each of the 20 coastal management areas that are managed to conserve least terns (which must include San Francisco Bay, Mission Bay, and San Diego Bay); and
- Assured land ownership and management objectives for future habitat management for the benefit of California least terns, and the security and status of Baja California colonies are assessed for incorporation into recovery objectives (USFWS 1985a).

In the 2006 five-year status review, we indicate that the recovery criteria outlined in the recovery plan do not reflect the best available and most up-to date information on the biology and habitat of the California least tern. Specifically, we state that the recovery plan does not consider the following factors: (1) new information about reproductive rates that suggests that the recovery plan criteria of no less than one fledge per tern pair may not be necessary for stable or increasing populations; (2) information about the location of additional nesting sites; (3) new modeling efforts regarding population viability analyses; (4) new predators and the effectiveness of predator control efforts; and (5) increased human populations along the California coastline and their impacts on habitat. At the time of listing in 1970, the USFWS did not complete a five-factor analysis; this analysis is provided in the five-year status review (USFWS 2006c).

6. Critical Habitat

Critical habitat has not been proposed or designated.

IV. Environmental Baseline

A. Ecoregional Settings of the Action Area

1. Coast Ranges

This ecoregion covers the coastal mountains of northwestern California and includes portions of Del Norte, Humboldt, Marin, Mendocino, San Mateo, Santa Clara, Santa Cruz, and Sonoma Counties. Redwood forests are a dominant component of the region, along with some hardwoods, such as tanoak, madrone, big leaf maple, California bay, and red alder. Beach pine and Bishop pine occur in many coastal sites. Coast Range forests do not include hemlock and have noble or red fir replacing grand fir, with rhododendron replacing chinquapin in the understory. Hardwoods increase in frequency on the drier slopes inland. The outer northern Coast Ranges, those farthest to the west, receive a great deal of rain (Hickman 1993). Riparian areas and north-facing slopes of the Coast Range fog belt support redwood forest, which thrive where coastal fog is frequent. Redwood is a California endemic. Proximity to the sea moderates temperatures, and fog helps prevent evapotranspiration (moisture loss from leaves). Fog drip contributes considerable moisture to the soil during the otherwise dry summer season (18–30 centimeters per year; Zinke 1977). The continuous moisture enables redwood forests to be home to a number of amphibians, including ensatinas, ocelot-spotted giant salamanders, tailed frogs, and seep salamanders, as well as the more common banana slugs (Bakker 1972).

Douglas-fir is often a codominant in redwood forests, becoming established after fires, and tanoak, California bay, madrone, and western hemlock are common understory trees where enough light penetrates the canopy (Zinke 1977). Redwood is a valuable timber tree because of its size and because of the wood’s unique resistance to rot. More than 85% of the old-growth coast redwood forests has been logged, but much of the original distribution of about 810,000 hectares remains in second-growth redwood forests of varying ages. Second-growth redwood forests support most of the same native vascular plants as old-growth forests, but habitat for species that depend on old-growth forests—such as spotted owls, marbled murrelets, some arthropods, mollusks, and canopy lichens—has been greatly reduced (USFWS 1995a). Logging of redwood continues, although most old-growth stands are now protected in state parks and in Redwood National Park.

Drier slopes of the Coast Ranges support mixed-evergreen and mixed-hardwood forests, whereas montane forests of subalpine fir and pines are found at higher elevations. Vegetation on the highest peaks is similar to that found at high elevations in the Sierra Nevada; peaks above 1,500 meters are treeless and experience heavy winter snows. Summers are hot and rainfall is low in the inner northern Coast Ranges, especially on eastern slopes in the rain shadow of the peaks. Serpentine soils are common, and dry eastern slopes support chaparral and pine oak woodland (Hickman 1993).

Landslides and debris slides are common, and lithology influences land-management strategies. Coastal headlands, high and low marine terraces, sand dunes, and beaches also characterize the region.

2. Klamath Mountains/California High North Coast Range

This ecoregion encompasses the highly dissected ridges, foothills, and valleys of the Klamath and Siskiyou Mountains and includes portions of Del Norte, Humboldt, and Mendocino Counties. It extends south into California to include the mixed conifer and montane hardwood forests that occur on mostly mesic soils in the North Coast Range mountains. The Klamath Mountains are geologically old and support mixed evergreen forests of Douglas fir, ponderosa pine, and sugar pine, with mountain hemlock, white fir, and chinquapin found at higher elevations. Serpentine soils are common in the Klamath Mountains. On the west side, Douglas fir hardwood forests grow at low elevations, giving way at higher elevation to white fir andDouglas-fir forests, white fir andCalifornia red fir forests, and finally to mountain hemlock and California red fir at the highest elevations. East and south of the highest ridges, the climate is drier and more continental. At low elevations, forests are dominated by ponderosa pine, which is replaced by white fir pine forests at higher elevations, then red fir andwhite fir forests, and finally mountain hemlock and red fir, with whitebark pine occurring at the highest elevations. The Klamath Mountains have a high floristic diversity, in part because they have acted as refugia supporting many endemics and relict species, including Pacific silver fir, subalpine fir, Alaska-cedar, Brewer spruce, Engelmann spruce, and foxtail pine. The complex vegetation patterns in the Klamath Mountains seem based primarily on differences in soils and secondarily on elevation and soil moisture (Sawyer and Thornburgh 1977).

3. Central California Foothills and Coastal Mountains

This area includes portions of Alameda, Marin, Monterey, Napa, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, San Francisco, Solano, and Sonoma Counties. The primary distinguishing characteristic of this ecoregion is its Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprising primarily chaparral and oak woodlands; grasslands occur in some low elevations and patches of pine are found at high elevations. Surrounding the lower and flatter Central California Valley, most of the region consists of open low mountains or foothills, but there are some areas of irregular plains and some narrow valleys. Large areas are ranchland and are grazed by domestic livestock. Relatively little land has been cultivated, although some valleys are major agricultural centers, such as the Salinas Valley or the wine vineyard centers of Napa and Sonoma Valleys. Natural vegetation includes coast live oak woodlands, Coulter pine, and unique native stands of Monterey pine in the west, and blue oak, black oak, and grey pine woodlands in the east.

4. Central California Valley

This area includes portions of Contra Costa and Solano Counties. Flat, intensively farmed plains with long, hot, dry summers and mild winters distinguish the Central California Valley ecoregion from its neighboring ecoregions that are either hilly or mountainous, covered with forest or shrub, and generally non-agricultural. This ecoregion includes the flat valley basins of deep sediments adjacent to the Sacramento and San Joaquin Rivers, as well as the fans and terraces around the edge of the valley. The two major rivers flow from opposite ends of the Central California Valley, entering into the Sacramento–San Joaquin River Delta and San Pablo Bay. The region once contained extensive prairies, oak savannas, desert grasslands in the south, riparian woodlands, freshwater marshes, and vernal pools. More than one-half of the region is now in cropland, about three-fourths of which is irrigated. Environmental concerns in the region include salinity due to evaporation of irrigation water, groundwater contamination from heavy use of agricultural chemicals, loss of wildlife and flora habitats, and urban sprawl.

5. Southern California Mountains

This area includes portions of Los Angeles, Orange, San Diego, and Ventura Counties. Like other ecoregions in central and southern California, the Southern California Mountains ecoregion has a Mediterranean climate of hot dry summers and moist cool winters. Although Mediterranean types of vegetation, such as chaparral and oak woodlands predominate in this region, elevations are considerably higher, summers are slightly cooler, and precipitation is greater than in adjacent ecoregions, resulting in denser vegetation and some large areas of coniferous woodlands. In parts of the Transverse Range, a slope effect causes distinct ecological differences. The south-facing slope of the range receives more precipitation (30–40 inches) than the northern slope (15–20 inches), but high evaporation rates on the southern side contribute to a cover of chaparral. On the northern side of parts of the ecoregion, low evaporation, low annual temperatures, and slow snowmelt allows for a coniferous forest that blends into desert montane habitats as it approaches the Mojave Basin and Range ecoregion boundary. Conifer species, such as Jeffrey, Coulter, and ponderosa pines, occur along with sugar pine, white fir, bigcone Douglas fir, and at the highest elevations, some lodgepole and limber pine. Severe erosion problems are common where the vegetation cover has been removed by fire, overgrazing, or land clearing. Large parts of the region are National Forest public land.

6. Southern California/Northern Baja Coast

This area includes portions of Los Angeles, Orange, San Diego, Santa Barbara, and Ventura Counties. This ecoregion includes coastal and alluvial plains, marine terraces, and some low hills in the coastal area of Southern California, and it extends over 200 miles south into Baja California. Coastal sage scrub and chaparral vegetation communities with many endemic species once were widespread before overgrazing, clearance for agriculture, and massive urbanization occurred. Coastal sage scrub includes chamise, white sage, black sage, California buckwheat, golden yarrow, and coastal cholla. Small stands of the unique Torrey pine occur near San Diego and on one of the Channel Islands. The chaparral-covered hills include ceanothus, manzanita, scrub oak, and mountain mahogany. Coast live oak, canyon live oak, poison oak, and California black walnut also occur.

B. Species Condition

1. Marbled Murrelet

a) Species Status and Conservation Needs/Efforts in the Action Area

The 2014 marbled murrelet population for Conservation Zone 6 is estimated at about 437 birds (95 percent confidence limit [CL]: 306 - 622; Table 4).

Lands considered necessary for the recovery of the marbled murrelet within California (Conservation Zones 4, 5, and 6) are: (1) any suitable habitat managed by the federal government in late-successional reserves (LSRs) located in the Forest Ecosystem Management Assessment Team Zone 1 (see pages IV-23 and IV-24 in Forest Ecosystem Management Assessment Team 1993 for a description of Zone 1), (2) other large areas of suitable habitat on federal lands outside of LSRs, (3) large areas of suitable habitat on state lands within 25 miles of the coast in California and Oregon, (4) suitable habitat on county park lands within 25 miles of the coast in San Mateo and Santa Cruz Counties, California, and (5) suitable nesting habitat on Pacific Lumber Company (now Humboldt Redwood Company) lands in Humboldt County, California (USFWS 1997).

Table 4. Population estimates for marbled murrelets in central California Conservation Zone 6 between 1999 and 2014.

Year	Both Directions			North			South		
	N	95% CL	n	N	95% CL	n	N	95% CL	n
1999		N/A		487	333-713	5		No surveys	
2000		N/A		496	338-728	8		No surveys	
2001	661	556-786	15	637	441-809	8	733	583-922	7
2002	683	561-832	15	628	487-809	9	729	494-1075	6
2003	699	567-860	12	615	463-815	6	782	570-1074	6
2004		No surveys			No surveys			No surveys	
2005		No surveys			No surveys			No surveys	
2006		No surveys			No surveys			No surveys	
2007	378	238-518	4	269	109-429	2	488	349-626	2
2008	174	91-256	4	122	61-184	1	225	131-319	3
2009	631	449-885	8	495	232-1054	4	789	522-1193	4
2010	446	340-585	7	366	240-559	4	560	343-925	3
2011	433	339-553	6	320	225-454	2	452	331-618	4
2012	487	403-588	6	475	373-605	3	501	359-699	3
2013	628	386-1022	6	428	227-806	3	556	126-2456	3
2014	437	306-622	9	386	232-644	5	543	330-893	4

Marine areas in California considered necessary for recovery of the marbled murrelet include:

- Nearshore waters (within 1.2 miles of the shore) along the Pacific Coast from the Oregon-California border south to Cape Mendocino in northern California, including Humboldt and Arcata Bays, and river mouths; and
- Nearshore waters (within 1.2 miles of shore) along the Pacific Coast in central California from San Pedro Point south to the mouth of the Pajaro River (USFWS 1997).

b) Critical Habitat in the Action Area

Designated federal critical habitat for the marbled murrelet in California encompasses 31 subunits (80 Federal Register 164:51506, August 2015). Designated federal critical habitat within the proposed action area includes Humboldt, Marin, Monterey, San Luis Obispo, San Mateo, Santa Clara, and Sonoma Counties (APHIS-WS Biological Assessment, Appendix F).

2. Western Snowy Plover

a) *Species Status and Conservation Needs/Efforts in the Action Area*

In California, the majority of Pacific Coast Western snowy plovers are present from San Francisco Bay southward (USFWS unpublished data), although more recent breeding activity has been detected within suitable habitat at several locations used infrequently by plovers, including in northern California (RU2; *e.g.*, Tolowa Dunes, Freshwater Lagoon, Stone Lagoon), Monterey Bay (RU4; *e.g.*, Limantour Spit), and in southern California (RU6; *e.g.*, N. Dockweiler SB, Malibu Lagoon, Santa Monica; Huntington SB) in 2016-2017 (USFWS unpublished data).

In California, 1,807 western snowy plovers were counted during the 2016 breeding window survey, and 3,802[2] western snowy plovers were counted during the 2016-2017 winter window survey (USFWS 2017). Survey numbers demonstrate that a large percentage of all western snowy plovers in the Pacific coast range were counted in California during both winter and breeding window surveys. In a 2014 western snowy plover population viability analysis, Hudgens *et al*. (2014) suggest that sites south of Point Reyes National Sea Shore in California are expected to be population sources for sites in the higher latitudes of the Pacific coast range.

Since listing of the plover in 1993, a multi-agency plover working group has cooperated extensively to implement a wide variety of plover conservation actions. These partners continue to work to implement appropriate management of coastal areas for recovery of the plover. The most common management strategies include habitat restoration, predator management, protection of nests with predator exclosures, signing and symbolic fencing of nesting areas, restrictions on motorized vehicles in the vicinity of plover nests and broods, restrictions on dogs (*Canis familiaris*) in plover nesting areas, and public information and outreach. These combined strategies are effective means of improving plover reproductive success. Several factors that are common throughout much of the range of the species also directly or indirectly affect plovers within the action area. Detailed information on many of these stressors can be found within the Pacific Coast Population of the Western Snowy Plover Recovery Plan (USFWS 2007).

b) *Critical Habitat in the Action Area*

Designated federal critical habitat for the Western snowy plover in California was revised in 2012 and encompasses 47 units totaling 16,337 acres (USFWS 2012b). Designated federal critical habitat within the proposed action area includes South

[2] This number likely includes wintering inland birds that are not part of the listed Pacific coast population

San Francisco Bay, Monterey Bay, Morro Bay, Big Sur, and San Luis Obispo Bay (APHIS-WS Biological Assessment, Appendix E).

3. California Clapper Rail

The Action Area includes the entire range of the species. Please refer to the 'Status of the Species' section above for more detailed information regarding current environmental baseline and the species condition.

No critical habitat has been designated for this species.

4. Light-footed Clapper Rail

The Action Area includes the entire range of the species. Please refer to the 'Status of the Species' section above for more detailed information regarding current environmental baseline and the species condition.

No critical habitat has been designated for this species.

5. California Least Tern

The Action Area includes the entire range of the species. Please refer to the 'Status of the Species' section above for more detailed information regarding current environmental baseline and the species condition.

No critical habitat has been designated for this species.

6. Salt Marsh Harvest Mouse

The Action Area includes the entire range of the species. Please refer to the 'Status of the Species' section for more detailed information regarding current environmental baseline for this species and the species condition.

No critical habitat has been designated for this species.

V. Effects of the Action

A. Marbled Murrelet

1. Exposure and Analysis

The exposure analysis presents the set of resources (species, populations, individuals, life stages or forms, or habitat elements) that are present in the action area and that are likely to be exposed to the action. These resources co-occur with the stressors caused by the activities APHIS-WS conducts in areas occupied by marbled murrelets. This analysis provides a foundation for determining whether the action could result in adverse effects or jeopardy to the species. Even though APHIS-WS will be coordinating with resource owners/agencies and obtaining known nest locations when conducting projects, new nests could be initiated or nests could go undetected and be exposed to impacts from APHIS-WS activities.

a) Timing and Duration of Exposure

Marbled murrelets occur in two types of settings within the Action Area: 1) old-growth coniferous forest areas (Coast Ranges) used for nesting extending inland 25 to 35 miles from the Pacific Ocean shoreline; and 2) nearshore areas (within 1.2. miles) along the coast used for breeding and foraging.

- Old-Growth Coniferous Forest Areas - Exposure in old-growth forest would be limited to APHIS-WS activities using the following methods/tools for predator management: padded-jaw foot hold traps, shooting (ground), and DRC-1339.

- Nearshore Areas - APHIS-WS activities would not be conducted in this area therefore no exposures to marbled murrelets would occur.

The proposed control of predators would occur during the nesting season; although, some of the work may also occur prior to the nesting season. Conducting predator-control activities prior to the nesting season is not only effective, but would also reduce the amount of work needed during the nesting season thereby reducing exposure. Predator control would be directed at areas that are occupied by nesting marbled murrelets. Frequency of activities will be "rare" for all activities with the exception of site access and shooting activities which will occur "weekly" (APHIS-WS Biological Assessment; Table 3). The exposure duration may be as long as the entire nesting season, and will be conducted annually (as funding permits) for the duration of this covered action.

b) Level of Exposure

The level of exposure describes the potential effects of the actions to the life stages of the species, the number of individuals, and the population as a whole.

The specific activities conducted by APHIS for each category and their expected frequency of use are summarized in Appendix A-1. There are no activities that are going be conducted on a daily basis. The frequency of activities that may be conducted weekly includes site access and shooting. The remaining activities not previously identified above will be conducted rarely, infrequently, or not at all.

The USFWS anticipates that adults, eggs, and chicks would be exposed to disturbance from the proposed action that may disrupt normal behaviors. Disturbance is in the form of visual contact with APHIS-WS personnel that are travelling by foot and motorized vehicle; and auditory contact with APHIS-WS personnel generating loud noises from implementing predator control activities. These and all other actions considered are described below.

2. Response Analysis

a) Actions Resulting in Insignificant or Discountable Effects

We anticipate the following activities to result in discountable or insignificant effects to marbled murrelet for the reasons described below.

(1) Dispersal/Deterrent Devices – Lasers, Scarecrows, and Effigies

According to Table 3 of APHIS-WS Biological Assessment, the use of lasers, scarecrows, and effigies will be rare in the action area. The frequency at which these methods would be used is not sufficient enough to indicate disturbance that would adversely affect the species. Therefore, the likelihood of adverse effects to marbled murrelets from these types of dispersal/deterrent devices is discountable.

(2) Inter-related and Interdependent Actions

(a) Disposal of Targeted Predators

All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods. Disposal will not occur at or near habitat areas. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take. The likelihood of adverse effects from this activity is discountable.

(b) Release or Rehabilitation of Avian Predators and Non-Target Wildlife

Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility. All unharmed non-target wildlife determined not to be a threat to protected species will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center until they can be released at a suitable location after the threatened or endangered species nesting season(s) has/have completed. There is a possibility that released avian predators could depredate on threatened or endangered species, but the likelihood of adverse effects from this activity is discountable.

(c) Staging and Access

Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS activities do not generally require staging areas. APHIS- activities are primarily temporary as are any structures they place in the field. Such temporary structures are removed following operations. The likelihood of adverse effects from this activity is discountable.

(d) Night Vision, Spotlights and Calling Devices

Use of night vision optics is not perceptible to animals (including threatened and endangered species) in the surrounding environment. Thus, the likelihood of adverse effects to the species from this inter-related action is discountable.

Use of spotlights by APHIS-WS personnel will be cautiously used when in nesting/breeding areas. APHIS-WS personnel will also focus spotlights away from protected species whenever possible and assess for any behavioral responses that may indicate harassment and discontinue use if necessary. The effects of this inter-related action are expected to be insignificant.

When using calling devices, APHIS-WS personnel carefully consider locations of its use to prevent drawing predators through areas that may be occupied by the threatened or endangered species, and ensure that there is availability of a safe backstop area for shooting downrange. The effects of this inter-related action are expected to be insignificant.

b) Actions Resulting in Not Likely to Adversely Affect

(1) Human Presence and Travel

Travel activities could cause disturbance to murrelets in two primary ways: 1) an incubating murrelet and/or chick may flush from the nest; or 2) increased vigilance or non-resting behaviors can increase energetic expenditures or decrease food deliveries, such that energetic costs exceed energy supply. A study looking at disturbance to marbled murrelets on nests in proximity to trails and roads showed that these factors did not influence murrelet behavior of adults or chicks to negatively affect nest success (Herbert and Golightly 2006). In addition, marbled murrelet nests are typically high in the redwood canopy.

Given factors and the frequency at which APHIS-WS personnel will be conducting all predator control actions under the PDMTE for this species (weekly or less), we anticipate adverse effects from this activity are not likely when combined with the specific avoidance and minimization measures to be employed.

(2) Shooting

Selective shooting of avian or mammalian predators would be highly species-selective and not present direct adverse effects. However, sound generated by these activities may result in measurable disturbance to murrelets. Although APHIS- WS will use silencing devices (suppressors) on firearms, sufficient sound reduction may not be achievable when added to existing ambient conditions, especially for shotguns.

Activities that create elevated sound levels at sensitive locations (*e.g.*, nest trees) have the potential to significantly disrupt normal behavior patterns. This method creates noise and visual disturbance when applied, but the requirement for open ground would prevent its deployment near most T&E nest/breeding sites. APHIS-WS will consult with site monitors/land managers on the location and timing if use of this method is warranted.

The level of take that may occur from visual and auditory disturbance is dependent on the frequency of these activities that APHIS-WS personnel would be conducting in the Action Area near active nests. APHIS-WS estimates that the frequency of these actions is weekly for shooting, and rare for cannon/rocket nets and net guns.

The following behaviors are assumed to have a reasonable likelihood of indicating a marbled murrelet has been harassed, as an effect of disturbance from sound or visual stimuli:

- Flushing of an adult or juvenile murrelet from the nest site or a perch site in the immediate vicinity of the nest.

- Aborted feeding(s) of a nestling, in which the adult abandons the feeding attempt, as in situations where the adult must return to foraging habitat to obtain new prey.

- Multiple delayed feeding attempts, in which adult delivery of food to the nestling is delayed multiple times, either within a single day, or across multiple days, due to human caused disturbance at or near the nest site.

These behaviors are difficult to witness or quantify under field conditions. The difficulty associated with documentation of these behaviors, especially in species, such as the marbled murrelet that rely on cryptic coloration and behavior to avoid detection, warrants a conservative interpretation of the limited data available on this subject. However, at this time, we have identified only those behaviors associated with active nest sites during the nesting season as potentially indicating harassment.

The USFWS (2006a) determined metrics for visual and auditory disturbances for murrelets based on a substantial review of the existing literature. The methodology for these metrics relies on a comparison of sound levels generated by the proposed action to pre-project ambient conditions. From this review they determined disturbance may reach the level of take when at least one of the following conditions is met:

- Project-generated sound exceeds ambient nesting conditions by 20-25 decibels (dB).

- Project-generated sound, when added to existing ambient conditions, exceeds 90 dB.

- Human activities occur within a visual line-of-sight distance of 40 m or less from a nest.

Given the many sources of variability in such an analysis, such as differences in individual bird response, variation in actual sound level produced by similar sources, variability in sound transmission during daily weather patterns, and non-standardization in sound metrics reported in the published literature, exact estimates of harassment distances are currently infeasible, and likely will remain so. Thus, the likelihood of injury for any particular individual would range from some low proportion to a higher value depending on its actual proximity to a particular sound/visual source. It is neither reasonable nor necessary for purposes of analysis and estimation of take to predict that all (or even a high proportion of) murrelets within this distance show harassment behaviors. Conversely, it is also unreasonable to conclude that murrelets beyond this distance would never be harassed. A more supportable interpretation is that currently available information does not support a conclusion that murrelets more distant to the anticipated sound/visual disturbances are likely to suffer a significant disruption of normal behavior patterns.

The likelihood of adverse effects from this activity is not likely based upon the frequency of use and the specific minimization measures to be employed.

c) Actions Resulting in Adverse Effects

None anticipated.

d) Actions Resulting in Beneficial Effects

Corvids are suspected to have caused the majority of known murrelet nest failures (56% of failed nests) (Nelson and Hamer 1995, Miller *et al*. 1997). Common ravens have been observed preying on murrelet eggs and nestlings, while Steller's Jays have been observed preying on murrelet nestlings and are strongly suspected of taking eggs at active murrelet nests (Singer *et al*. 1991, Nelson and Hamer 1995). Evidence at simulated murrelet nests indicates that corvids are a major nest predator and can greatly affect nesting success. However, a broad suite of avian nest predators are known or suspected to depredate real murrelet nests, including Steller's Jays, Gray Jays, Great Horned Owls (*Bubo virginianus*), Common Ravens (Nelson and Hamer 1995), Sharp-shinned Hawks (*Accipiter striatus*) (Marks and Naslund 1994), and Red-shouldered hawks (K. Nelson, pers. comm. as cited in Liebezeit and George 2002).

APHIS-WS activities are a critical component of improving nest success and assisting recovery efforts. A reduction in numbers of egg predators is expected to improve survival and recruitment and represent a significant contribution to the recovery of the species.

The following categories of activities, as described in the APHIS-WS Biological Assessment, are expected to contribute to recovery of the species and have beneficial effects:

- Physical Exclusion methods provide protection to the species by preventing predator access to nests, chicks, and adults, or provide hiding places/shelter to chicks, juveniles and adults.
- Dispersal and Deterrent Devices – these methods frighten or scare predators away from nesting areas enabling improved nest success and reproduction.

- Live Capture Traps/Tools and Lethal Tools/Techniques – these methods are designed to target specific animals predating on the threatened or endangered species of focus in the PDMTE. Removal of predators through these techniques reduces risk of the loss of individuals, and improves the likelihood of nest productivity for the threatened/endangered species of concern.

3. Summary of Effects to the Species

When analyzing the type, intensity, and frequency of the various activities in combination with species-specific measures employed by APHIS-WS, we do not expect the proposed action to result in lethal take, or other adverse effects to the species. There may be some disturbance to adults and young during nesting season from human presence/travel and shooting activities. However, this disturbance is not expected to be at a level to indirectly result in lethal take or harassment. Overall, in the context of removing/reducing predator impacts in occupied areas and supporting habitat, the effects of the proposed predator damage management actions are considered beneficial to the species for achieving recovery in the future.

B. Western Snowy Plover

1. Exposure Analysis

The exposure analysis presents the set of resources (species, populations, individuals, life stages or forms, or habitat elements) that are present in the action area and that are likely to be exposed to the action. These resources co-occur with the stressors caused by the activities APHIS-WS conducts in areas occupied by plovers. This analysis provides a foundation for determining whether the action could result in jeopardy.

Even though APHIS-WS will be coordinating with resource owners, agencies, and surveyors to obtain known nest locations prior to entering known nesting areas, new nests could be initiated, or nests could go undetected and be exposed to impacts from APHIS-WS activities. Thus, it is reasonably certain that a nest could be accidentally stepped on.

It is reasonably certain that presence of APHIS –WS personnel will create disturbance for the species, particularly during nesting periods that may alter their normal behavior.

It is also reasonably certain that shooting and pyrotechnic actions conducted by APHIS-WS personnel in these areas will create disturbance for the species that may alter their normal behavior.

a) Timing and Duration of Exposure

The proposed control of nest predators would likely occur during the plover nesting season; although, some of the work may also occur prior to the nesting season. Conducting predator-control activities prior to the nesting season is not only effective, but would also reduce the amount of work needed during the nesting season thereby reducing exposure. Predator control would be directed at areas that are occupied by nesting plovers. Frequency of activities will vary from rare (a majority of live capture traps/tools), to infrequent (all lethal tools/techniques except rodent traps and shooting), to weekly (rodent traps, bal-chatri traps, pole traps, Swedish goshawk traps, and pyrotechnics), or daily (shooting, cage traps, and padded foot-hold traps) (APHIS-WS Biological Assessment; Table 3). The exposure duration may be as long as the entire nesting season, and will be conducted annually (as funding permits) for the duration of this covered action.

b) Level of Exposure

The level of exposure describes the potential effects of the actions to the life stages of the species, the number of individuals, and the population as a whole. The specific activities conducted by APHIS for each category and their expected frequency of use are summarized in Appendix A-1. The frequency of activities that may be conducted daily during the nesting season includes site access, shooting, and live captures utilizing cage traps and padded foot-hold traps. Activities conducted weekly include the following: dispersal and deterrents utilizing pyrotechnics; live captures utilizing bal-chatri traps, pole traps, and Swedish goshawk traps; and lethal tools/techniques of rodent traps. The remaining activities not previously identified above will be conducted rarely, infrequently, not at all, or determined by APHIS-WS to have no effect.

The USFWS anticipates that eggs, and chicks would be potentially exposed to lethal crushing from APHIS-WS personnel travelling by foot in areas containing nests. Adult, chicks, and eggs may be exposed to disturbance by presence of APHIS-WS personnel in nesting areas, or by loud noises generated by shooting or pyrotechnic activities that may disrupt normal behaviors.

These and all other actions considered are described below.

2. Response Analysis

a) Actions Resulting in Insignificant or Discountable Effects

The following activities are anticipated to result in discountable or insignificant effects to plovers for the reasons described below.

(1) Dispersal and Deterrent Devices – Lasers, Scarecrows, and Effigies

According to the APHIS-WS (Biological Assessment, Table 3), the use of lasers, scarecrows, and effigies will be rare in the action area. The frequency at which these methods would be used is not sufficient enough to indicate disturbance that would adversely affect the species. Therefore effects to marbled murrelets from these types of dispersal/deterrent devices are expected to be insignificant.

(2) Live Capture Traps/Techniques

Traps designed to capture small animals, such as decoy or walk-in traps, may be placed in plover habitat. These traps are generally baited with live birds to attract individuals of the same species. Because plovers avoid corvids, they are not expected to get close to or enter traps containing these predators. Thus, the likelihood of adverse effects to plover from decoy or walk-in traps is considered discountable. Also, the entrances to these traps will be large enough to allow plovers to enter and exit uninhibited. Devices, such as modified padded foot-hold traps, may also be used to capture avian predators and predatory mammals. Because the tension sets on foot-hold traps are set for larger target species, they would not be triggered by a bird as small as a plover. Therefore, effects of small animal traps on plovers are anticipated to be discountable. Large animal traps will not generally be set in plover habitat, and even if they were, plovers are too small to be affected. The likelihood of adverse effects to plovers from large traps is discountable.

(3) Lethal Tools/Techniques – Egg Addling, Oiling, and Nest Destruction

Egg addling, oiling, or nest destruction is specific to the targeted predator species of interest. APHIS-WS personnel are adequately trained in identifying eggs and nests of targeted predators and are not expected to target western snowy plover nests accidentally. The likelihood of adverse effects from this activity is discountable.

(4) Inter-related and Interdependent Actions

(a) Disposal of Targeted Predators

All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods. Disposal will not occur at or near habitat areas. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take. The likelihood of adverse effects from this activity is discountable.

(b) Release or Rehabilitation of Avian Predators and Non-Target Wildlife

Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility. All unharmed non-target wildlife determined not to be a threat to protected species will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center until they can be released at a suitable location after the threatened or endangered species nesting season(s) has/have completed. There is a possibility that released avian predators could depredate on threatened or endangered species but the likelihood of adverse effects from this activity is discountable.

(c) Staging and Access

Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS activities do not generally require staging areas. APHIS-WS activities are primarily temporary as are any structures they place in the field. Such temporary structures are removed following operations. The likelihood of adverse effects from this activity are discountable.

(d) Night Vision, Spotlights and Calling Devices

Use of night vision optics is not perceptible to animals (including threatened and endangered species) in the surrounding environment. The effects of this inter-related action are discountable.

Use of spotlights by APHIS-WS personnel will be cautiously used when in nesting/breeding areas. APHIS-WS personnel will also focus spotlights away from protected species whenever possible and assess for any behavioral responses that may indicate harassment and discontinue use if necessary. The effects of this inter-related action are expected to be insignificant.

When using calling devices, APHIS-WS personnel carefully consider locations of its use to prevent drawing predators through areas that may be occupied by the threatened or endangered species, and ensure that there is availability of a safe backstop area for shooting downrange. The effects of this inter-related action are expected to be insignificant.

b) Actions Resulting in Not Likely Adverse Effects

(1) Pyrotechnics, Shooting, and Net Gun/Launchers
Selective shooting of avian or mammalian predators would be highly species selective. APHIS-WS are professionals with training in the identification of targeted predators and therefore direct effects from accidental mortalities from shooting are not likely. However, sound generated by these activities may result in measurable disturbance to western snowy plover. Although APHIS-WS will use silencing devices (suppressors) on firearms, sufficient sound reduction may not be achievable when added to existing ambient conditions- especially for shotguns.

Use of pyrotechnics, shotguns, rifles, and net gun/launchers can be extremely loud when firing and this noise could adversely affect listed species as individuals react to the noise. Western snowy plovers reacting to noise disturbance by flushing may be exposed to predation, and extra energy expenditure. If this happens during the breeding season, eggs or chicks could be exposed to inclement weather, increased predation risk, or separated from adults, ultimately leading to loss of those eggs or chicks and failure of that breeding attempt. Repeated reaction to noise disturbance can result in exhaustion, nests being abandoned, chicks becoming separated from adults, and reproductive failure. If the noise is loud enough, permanent hearing damage could occur, reducing the likelihood of survival for that individual. We expect effects from noise to be most dramatic closest to the firing weapon. The probability of effects will decrease with distance as the volume attenuates and wind and wave noise masks the sound from the small arms.

Studies indicate that birds are resistant to permanent auditory damage and hearing loss from noise exposure when exposed to high-intensity impulse noise. Birds can tolerate continuous (up to 72 hours) exposure to noises up to 110 dB without experiencing hearing damage or permanent threshold shift. Continuous noise above 110 dB and impulse noise above 125 dB can result in hearing damage/loss. Temporary threshold shift (temporary loss of hearing that can last a few seconds to days), however, can occur from continuous noise levels between 93 and 110 dB (Dooling and Popper 2007).

Studies indicate an increase in noise of 3 to 10 dB corresponds to 30 to 90 percent reductions in alerting distances for wildlife (Barber *et al*. 2009), impairing their abilities to signal and listen, which are necessary for reproduction and survival (USFWS 2011). Additionally, studies of noise criteria suggest that noise levels above 80 to 85 dB are disruptive to normal behavioral patterns in birds, such as foraging, breeding, egg incubation, and rearing of young (Transportation Noise Control Center 1997). Increased noise during nesting season could result in displacing birds from their nests, leaving eggs, young, and adults more susceptible to predation or environmental stress (for example, egg temperature changes, and exposure to wind and blowing sand or soil that could result in burial of eggs).

Relative to the effects described above and application of a noise attenuation factor of 6.75 dB/doubling of distance from the source, western snowy plovers within varying distances of each device can be expected to experience effects ranging from behavior disturbance to permanent hearing damage; mortality may also result from these effects. However, because the proposed project noise is expected to be delivered in intermittent impulses rather than for extended durations, and minimization measures for pyrotechnics and shooting would be employed, adverse effects from noise generated by these activities are not anticipated. Table A-2 in the appendix illustrates the estimated noise attenuation of distance for each device and relative expected effects to western snowy plovers.

c) Actions Resulting in Adverse Effects

(1) Human Presence, Travel, & Grid Searches

(a) Physical Crushing/Injuring of Nests, Young, or Adults

Plover adults and chicks have been observed using human footprints for loafing. Their cryptic coloring and habit of crouching in depressions makes very young plover chicks vulnerable to crushing. However, careful walking by a well-informed surveyor is unlikely to result in crushing of adults and older chicks. Nests or eggs may be more difficult to avoid. APHIS-WS will coordinate with CDFW and USFWS surveyors and get GPS locations of all known active nests prior to entering plover areas during the nesting season; however, surveys are only conducted once a week and it is possible that new nests may be initiated between the time when the area is surveyed and APHIS-WS enters nesting areas.

Plover adults and chicks have been observed using tire tracks for loafing. This behavior increases their chances of being run over. Plover chicks when exceedingly young may have difficulty getting out of tire ruts, thereby increasing their likelihood of being run over. Their cryptic coloring and habit of crouching in depressions (such as tire tracks) makes plover chicks especially vulnerable to vehicular traffic. Plovers forage along the wrack line and young chicks may be at risk of being crushed by vehicles even in the wet sand. Reuse of vehicle tracks would generally be avoided to reduce the likelihood of crushing chicks. Because vehicle travel will be restricted to the moist sand areas only, we do not anticipate nests with eggs to be crushed by vehicles. However, it is reasonably certain that a chick will be inadvertently injured or killed by vehicles driving in areas where broods would be foraging.

Grid searches for snakes have similar but potentially increased risk to cause direct effects on Western snowy plovers as site access and human presence. If APHIS-WS personnel will be operating in and around nesting areas conducting the search, there is the potential to step on or otherwise accidently crush a nest.

(b) Disturbance

Implementation of predator control activities requires deployment of equipment and personnel in occupied areas and habitats. Some activities will be conducted on a daily basis during the breeding season period. We expect the presence of APHIS-WS staff will cause plovers to temporarily avoid preferred feeding or resting areas. Walking near active nests may cause adults to flush off of nests. When an incubating or brooding adult is flushed off a nest or chicks, it leaves the eggs and brood vulnerable to predation and the elements (*e.g.*, being chilled on cold days). The combination of people and sudden movement of plovers can attract the attention of corvids that may be in the area and therefore increase the risk of predation. Entering these areas is reasonably certain to result in a significant disruption of normal foraging, incubation, and brooding behaviors. Repeated operations may cause birds to move into marginal habitats where their chances of reproductive success and survival would likely be reduced. Plovers may spend more energy on vigilance and avoidance behavior at the expense of foraging activity. Causing plovers to flush or stop feeding may significantly disrupt their foraging, nesting, and roosting activities, thereby decreasing energy reserves needed for survival, migration, and reproduction.

However, other factors may ameliorate or eliminate such possible effects. If a plover were flushed from a nest as a result of APHIS-WS staff walking through the area and that attracted a predator, such predator would likely be shot by APHIS-WS staff. Overall, reduced predator numbers in the immediate area with ongoing implementation by APHIS-WS would make predation less likely when nesting adults are flushed in the future. Furthermore, fewer predators as a result of this program may mean less stress and therefore more energy reserves for survival, migration, and reproduction.

As currently described, we anticipate measures to reduce but not eliminate disturbance will help protect the nesting area and young broods. However, we consider the following common causes of disturbance. Vehicle traffic may flush an incubating or brooding adult, leaving the eggs and brood vulnerable to predation and the elements (*e.g.*, being chilled on cold days). The combination of vehicles and sudden movement of plovers can attract the attention of corvids that may be in the area and therefore increase the risk of predation.

Operation of vehicles is also reasonably certain to cause plovers to temporarily avoid preferred feeding or loafing areas. Avoidance of these areas would represent a disruption of normal foraging, incubation, and brooding behaviors. Repeated travel into plover nesting areas is also likely to cause birds to move into marginal habitats where their chances of reproductive success and survival may be reduced. Disturbed plovers may spend more energy on vigilance and avoidance behavior at the expense of foraging activity. Causing plovers to flush or stop feeding would likely decrease the energy reserves necessary for survival, migration, and reproduction. These disruptions are also likely to increase the exposure of plovers to predators. Specific to APHIS-WS, we then considered how their activities might cause such effects. We anticipate that APHIS-WS may travel on nesting beaches by vehicle numerous times (10 or more round trips along the beach) during the nesting season. This may disturb the plovers encountered. Given the frequency and time of year when predator-control activities will be conducted in plover habitat (prior to and during the nesting season), it is reasonably certain that a small number of adult plovers and chicks will experience a significant disruption of normal brooding and foraging behaviors (*i.e.*, due to avoidance of the area and/or repeated flushing) as a result of APHIS-WS vehicle activities.

(2) Rodent Traps

Rodent snap traps set to control rodents predating on the Western snowy plovers nests have the potential to inadvertently capture/kill plovers or chicks. APHIS-WS deploys snap traps in areas where rodents frequent and not near known Western snowy plover nests or they may house snap traps in elevated stations to remove potential for physical exposures of western snowy plovers to snap traps. Although no western snowy plovers have been accidentally captured/killed in snap traps deployed by APHIS-WS in the past, the potential for non-target capture/kill still exists.

d) Actions Resulting in Beneficial Effects

Predator control through judicious use and placement of electric fences and other barriers, as well as by trapping efforts, have reduced losses of western snowy plover adults, eggs, and/or young (USFWS 2006b). Nest and chick predation has been identified by the recovery plan (USFWS 2007) as an important threat to address for plover recovery. APHIS-WS activities are a critical component of those efforts. APHIS-WS will work on Federal, State, Tribal, and private lands to implement control programs directed at predators of plover nests and chicks. A reduction in numbers of egg and chick predators is expected to improve survival and recruitment and represent a significant contribution to the recovery of the species. After enclosures and mammalian predator control came into use to protect nests around Monterey Bay, annual clutch hatching rates for Western snowy plover nests have climbed from 43 to 68 percent (Neuman *et al*. 2004; USFWS 2007).

The following categories of activities, as described in the APHIS-WS Biological Assessment, are expected to contribute to recovery of the species and have beneficial effects:

- Physical Exclusion methods provide protection to the species by preventing predator access to nests, chicks, and adults, or provide hiding places/shelter to chicks, juveniles and adults.
- Dispersal and Deterrent Devices – these methods frighten or scare predators away from nesting areas enabling improved nest success and reproduction.
- Live Capture Traps/Tools and Lethal Tools/Techniques – these methods are designed to target specific animals predating on the threatened or endangered species of focus in the PDMTE. Removal of predators through these techniques reduces risk of the loss of individuals, and improves the likelihood of nest productivity for the threatened/endangered species of concern.

3. Summary of Effects to the Species

Based upon frequency of actions that are anticipated to be conducted, there is a likelihood that mortalities of adults, young chicks, and eggs may occur unintentionally in occupied areas where adults are tending to active nests. The specific activities that have a likelihood of causing mortalities include 1) physical crushing/injuring of adults, young chicks, or eggs from travel by foot or vehicle, 2) physical crushing/injuring of adults, young chicks, or eggs from grid searches, and 3) physical injury/death of foraging adults from accidental capture in rodent snap traps.

We anticipate that loud noise generated from shooting and use of pyrotechnics in/near nesting areas could disrupt the normal behavior some adults and their young, but because noise generation would be intermittent and because minimization measures would be implemented, we do not anticipate adverse effects would result from these activities. We anticipate that foot travel and vehicle use, is likely to disrupt the normal behavior some adults and their young. This disturbance is not expected to be at a level that would indirectly result in lethal take, but nonetheless would be an adverse effect to the species.

While there will be adverse effects to the species from some of the proposed predator damage management actions, we anticipate the program will result in a net overall benefit to the species for achieving recovery in the future.

C. California Clapper Rail

1. Exposure and Analysis

The exposure analysis presents the set of resources (species, populations, individuals, life stages or forms, or habitat elements) that are present in the action area and that are likely to be exposed to the action. These resources co-occur with the stressors caused by the activities APHIS-WS conducts in areas occupied by clapper rails. This analysis provides a foundation for determining whether the action could result in jeopardy.

Even though APHIS-WS will be coordinating with resource owners, agencies, and surveyors to obtain known nest locations prior to entering known nesting areas, new nests could be initiated, or nests could go undetected and be exposed to impacts from APHIS-WS activities. Thus, it is reasonably certain that a nest could be accidentally stepped on.

It is reasonably certain that presence of APHIS –WS personnel along with noise generated by vehicles or watercraft will create disturbance for the species, particularly during nesting periods that may alter their normal behavior.

It is also reasonably certain that shooting and pyrotechnic actions conducted by APHIS-WS personnel in these areas will create disturbance for the species that may alter their normal behavior.

a) Timing and Duration of Exposure

The proposed control of nest predators would likely occur during the California clapper rail nesting season; although, some of the work may also occur prior to the nesting season. Conducting predator-control activities prior to the nesting season is not only effective, but would also reduce the amount of work needed during the nesting season thereby reducing exposure. Predator control would be directed at areas that are occupied by nesting clapper rails. Frequency of activities may be up to several days per week. The exposure duration may be as long as the entire nesting season, and will be conducted annually (as funding permits) for the duration of this covered action.

b) Level of Exposure

The level of exposure describes the potential effects of the actions to the life stages of the species, the number of individuals, and the population as a whole. The specific activities conducted by APHIS for each category and their expected frequency of use are summarized in Appendix A-1. The frequency of activities that may be conducted daily during the nesting season includes shooting and installation/checking of cage traps. The frequency of the all the remaining activities and their categories (dispersal and deterrent devices, live capture traps/tools, and lethal tools/techniques) are conducted on an infrequent or rare basis, or not conducted at all.

The USFWS anticipates that adults, eggs, and chicks would be exposed to disturbance that may disrupt normal behaviors and would be exposed to humans travelling by foot, motorized vehicle, or watercraft. Adults, eggs, and chicks may also be exposed to disturbance from loud noises generated from shooting activities. The remaining activities are not expected to be frequent enough to disrupt behaviors of adults, eggs, and chicks therefore exposing them to disturbance.

These and all other actions considered are described below.

2. Response Analysis

a) Actions Resulting in Insignificant or Discountable Effects

The following activities are anticipated to result in discountable or insignificant effects to California clapper rails for the reasons described below.

(1) Dispersal and Deterrent Devices – Lasers, Scarecrows, and Effigies

Lasers, scarecrows, and effigy use in California clapper rail habitat is expected to be rare. Their use may provide attractive perching areas for predatory birds. However, these methods are designed to illicit avoidance behaviors in predatory birds that discourage them away from nesting areas. The likelihood of adverse effects is considered discountable.

(2) Live Capture Traps/Techniques

Traps designed to capture small animals (birds and mammals) may be placed in California clapper rail habitat. Traps baited with live birds (corvids) will attract individuals of the same species. Because clapper rails avoid corvids, they are not expected to get close to or enter traps containing these predators. Also, the entrances to these traps will be large enough to allow clapper rails to enter and exit uninhibited. Thus, the likelihood of adverse effects to clapper rails from decoy or walk-in traps is considered discountable.

Large animal traps will not generally be set in California clapper rail habitat, and even if they were, clapper rails are too small to be affected. The likelihood of adverse effects to clapper rails from large traps is discountable.

Devices, such as modified padded foot-hold traps, may also be used to capture avian predators and predatory mammals. Because the tension sets on foot-hold traps are set for larger target species, they would not be triggered by a California clapper rail bird. Frequency of use for this activity is also conducted infrequently. Therefore, effects of small animal traps on California clapper rails are anticipated to be discountable.

(3) Lethal Tools/Techniques - Egg addling, oiling, and nest destruction

Egg addling, oiling, or nest destruction is specific to the targeted predator species of interest. APHIS-WS personnel are adequately trained in identifying eggs and nests of targeted predators and are not expected to target California clapper rail nests accidentally. The likelihood of adverse effects from this activity is discountable.

(4) Inter-related and Interdependent Actions

(a) Disposal of Targeted Predators

All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods. Disposal will not occur at or near habitat areas. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take. The likelihood of adverse effects from this activity is discountable.

(b) Release or Rehabilitation of Avian Predators and Non-Target Wildlife

Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility. All unharmed non-target wildlife determined not to be a threat to protected species will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center until they can be released at a suitable location after the threatened or endangered species nesting season(s) has/have completed. There is a possibility that released avian predators could depredate on threatened or endangered species but the likelihood of adverse effects from this activity is discountable.

(c) Staging and Access

Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS activities do not generally require staging areas. APHIS-WS activities are primarily temporary as are any structures they place in the field. Such temporary structures are removed following operations. The likelihood of adverse effects from this activity is discountable.

(d) Night Vision, Spotlights and Calling Devices
Use of night vision optics is not perceptible to animals (including threatened and endangered species) in the surrounding environment. The likelihood of effects from this inter-related action is discountable.

Use of spotlights by APHIS-WS personnel will be cautiously used when in nesting/breeding areas. APHIS-WS personnel will also focus spotlights away from protected species whenever possible and assess for any behavioral responses that may indicate harassment and discontinue use if necessary. The effects of this inter-related action are anticipated to be insignificant.

When using calling devices, APHIS-WS personnel carefully consider locations of its use to prevent drawing predators through areas that may be occupied by the threatened or endangered species, and ensuring that there is availability of a safe backstop area for shooting downrange. The effects of this inter-related action are anticipated to be insignificant.

b) Actions Resulting in Not Likely Adverse Effects

(1) Shooting, Pyrotechnics, and Net Guns/Launchers

Selective shooting of avian or mammalian predators would be highly species-selective. APHIS-WS personnel are professionals trained in the identification of targeted predators. The protocols require APHIS-WS personnel to coordinate with refuge and CDFW biologists immediately prior to going into areas used by California clapper rails to shoot corvids or conduct other control measures in rail habitat. The likelihood of direct adverse effects to clapper rails from accidental shooting is discountable.

Use of pyrotechnics, shotguns, rifles, net guns/launchers can be extremely loud when firing, and this noise could adversely affect listed species as individuals react to the noise. California clapper rails reacting to noise disturbance by flushing may be exposed to predation, and extra energy expenditure. If this happens during the breeding season, eggs or chicks could be exposed to inclement weather, increased predation risk, or separated from adults, ultimately leading to loss of those eggs or chicks and failure of that breeding attempt. Repeated reaction to noise disturbance can result in exhaustion, nests being abandoned, chicks becoming separated from adults, and reproductive failure. If the noise is loud enough, permanent hearing damage could occur, reducing the likelihood of survival for that individual. We expect adverse effects from noise to be most dramatic closest to the firing weapon. The probability of adverse effects will decrease with distance as the volume attenuates and wind and wave noise masks the sound from the small arms.

Studies indicate that birds are resistant to permanent auditory damage and hearing loss from noise exposure when exposed to high-intensity impulse noise. Birds can tolerate continuous (up to 72 hours) exposure to noises up to 110 dB without experiencing hearing damage or permanent threshold shift. Continuous noise above 110 dB and impulse noise above 125 dB can result in hearing damage/loss. Temporary threshold shift (temporary loss of hearing that can last a few seconds to days), however, can occur from continuous noise levels between 93 and 110 dB (Dooling and Popper 2007).

Studies indicate an increase in noise of 3 to 10 dB corresponds to 30 to 90 percent reductions in alerting distances for wildlife (Barber *et al*. 2009), impairing their abilities to signal and listen, which are necessary for reproduction and survival (USFWS 2011). Additionally, studies of noise criteria suggest that noise levels above 80 to 85 decibels are disruptive to normal behavioral patterns in birds, such as foraging, breeding, egg incubation, and rearing of young (Transportation Noise Control Center 1997 in USFWS 2013). Increased noise during nesting season could result in displacing birds from their nests, leaving eggs, young, and adults more susceptible to predation or environmental stress (for example, egg temperature changes, and exposure to wind and blowing sand or soil that could result in burial of eggs).

Relative to the effects described above and application of a noise attenuation factor of 6.75 dB/doubling of distance from the source, California clapper rails within varying distances of each device can be expected to experience effects ranging from behavior disturbance to permanent hearing damage; mortality may also result from these effects. However, because the proposed project noise is expected to be delivered in intermittent impulses rather than for extended durations, and minimization measures for pyrotechnics and shooting would be employed, adverse effects from noise generated by these activities are not anticipated. Table A-2 in the appendix illustrates the estimated noise attenuation of distance for each device and relative expected effects to California clapper rails.

c) Actions Resulting in Adverse Effects

(1) Human Presence and Travel

(a) Physical Crushing/Injuring of Nests, Young Chicks, or Adults
Since APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment, there is the potential to step on, knock down or otherwise accidently crush an unknown nest. California clapper rails have been known to posture and defend a nest (USFWS

2012a), which reduces the likelihood of this direct effect. Close coordination with the site managers, biologists, and monitors will be necessary to minimize any effects to the California clapper rails, nests, or broods. Because vehicle travel will be restricted to established roads/paths, we do not anticipate nests with eggs to be crushed by vehicles. However, it is reasonably anticipated that travel by foot or watercraft may inadvertently injure or kill eggs or young chicks via crushing in areas where broods would be foraging.

(b) Disturbance

Clapper rails vary in their sensitivity to human disturbance, both individually and between marshes. Clapper rails have been documented nesting in areas with high levels of disturbance, including areas adjacent to trails, levees, and roads heavily used by pedestrian and vehicular traffic (J. Didonato pers. comm., Baye *in litt*. 2008). In contrast, direct human-caused disturbance to the California clapper rail is known to occur in some locations of the Bay Trail (Albertson *in litt*. USFWS 2009c).

Although clapper rails may occur in areas with high levels of human-related disturbance, the effects of the disturbance on the rails is unknown and potentially significant. Many marshes only support very small clapper rail populations (*e.g*., only two rails detected at BSRA in 2005; Herzog et. al. 2005), which suggests that even minor incursions could disrupt and potentially extirpate vulnerable small populations or subpopulations. Because most clapper rail marshes are subjected to a variety of uses, the cumulative detrimental effects may be appreciable. Numerous routine human activities have the potential to adversely affect individual rails and overall population viability.

Data on reproductive success of nests near heavily trafficked areas are lacking. Clapper rails nesting next to regularly disturbed areas are likely to be subject to higher rates of predation due to easy access provided by trails, levees, and roads. Disturbance of incubating or brooding adults may translate into reduced hatch or fledge success of young through increased nest predation if the adult vacates the nest, or through temperature stress (heat or cold) due to lack of thermoregulation by the adult. Reduced reproductive success results in reduced recruitment to an already unstable endangered population. In addition, continued disturbance may stress the adults and reduce survival through disruption of normal activities, such as reduced foraging or resting time or increased susceptibility to predators. Reduced survival of adult clapper rails, which has been identified as the most critical life stage in population models (M. Johnson unpubl. data; Foin *et al*. 1997), may also impact the long-term viability of the population. The ramifications of disturbance related to human traffic during breeding season primarily include effects on eggs and chicks or the the species' seasonal reproductive effort.

Clapper rail reactions to disturbance may vary with season; however, both breeding and non-breeding seasons are critical times. Disturbance during the non-breeding season may primarily affect survival of adult and sub-adult rails. Adult clapper rail mortality is greatest during the winter (Eddleman 1989, Albertson 1995), primarily due to predation (Albertson 1995). Human-related disturbance of clapper rails in the winter, particularly during high tide and storm events, may increase vulnerability to predators. The presence of people and their pets in the high marsh plain or near upland areas during winter high tides may prevent rails from leaving the lower marsh plain (Evens and Page 1983). Rails that remain in the marsh plain during inundation are vulnerable to predation due to minimal vegetative cover available (Evens and Page 1986). This situation is exacerbated in small diked marshes with little to no high tide refugia or high marsh plain.

Use of vehicles or watercraft to approach T&E protection sites could cause disturbance similar to that of human presence. California clapper rails have been known to posture and defend a nest (USFWS 2012a), which reduces the likelihood of this direct effect.

d) Actions Resulting in Beneficial Effects

Nest and chick predation has been identified by the recovery plan (USFWS 2013b) as an important threat to address for California Clapper rail recovery. APHIS-WS activities are a critical component of those efforts. APHIS-WS will work on Federal, State, Tribal, and private lands to implement control programs directed at predators of California Clapper rail nests and chicks. A reduction in numbers of egg and chick predators is expected to improve survival and recruitment and represent a significant contribution to the recovery of the species. Predator control has been conducted at San Francisco Bay National Wildlife Refuge Complex for over a decade, with positive results in the California Clapper rail population.

The following categories of activities, as described in the APHIS-WS Biological Assessment, are expected to contribute to recovery of the species and have beneficial effects:

- Physical Exclusion methods provide protection to the species by preventing predator access to nests, chicks, and adults, or provide hiding places/shelter to chicks, juveniles and adults.
- Dispersal and Deterrent Devices – these methods frighten or scare predators away from nesting areas enabling improved nest success and reproduction.
- Live Capture Traps/Tools and Lethal Tools/Techniques – these methods are designed to target specific animals predating on the threatened or endangered species of focus in the PDMTE. Removal of predators through

these techniques reduces risk of the loss of individuals, and improves the likelihood of nest productivity for the threatened/endangered species of concern.

3. Summary of Effects to the Species

Based upon frequency of actions that are anticipated to be conducted, there is a likelihood that mortalities of young chicks, and eggs may occur unintentionally in occupied areas where adults are tending to active nests. The specific activities that have a likelihood of causing mortalities is travel by foot or watercraft in saltmarsh areas that may inadvertently injure or kill eggs or young chicks via crushing in areas where broods would be foraging.

Adults, eggs, and chicks are likely exposed to disturbance that may disrupt normal behaviors and would be exposed to humans travelling by foot, motorized vehicle, or watercraft. However, this disturbance is not expected to be at a level that would indirectly result in lethal take, but nonetheless would be an adverse effect to the species.

While there will be adverse effects to the species from some of the proposed predator damage management actions, we anticipate the program will result in a net overall benefit to the species for achieving recovery in the future.

D. Light-footed Clapper Rail

1. Exposure and Analysis

The exposure analysis presents the set of resources (species, populations, individuals, life stages or forms, or habitat elements) that are present in the action area and that are likely to be exposed to the action. These resources co-occur with the stressors caused by the activities APHIS-WS conducts in areas occupied by plovers. This analysis provides a foundation for determining whether the action could result in jeopardy.

Even though APHIS-WS will be coordinating with resource owners, agencies, and surveyors to obtain known nest locations prior to entering known nesting areas, new nests could be initiated, or nests could go undetected and be exposed to impacts from APHIS-WS activities. Thus, it is reasonably certain that a nest could be accidentally stepped on.

It is reasonably certain that presence of APHIS –WS personnel will create disturbance for the species, particularly during nesting periods that may alter their normal behavior.

It is also reasonably certain that shooting and pyrotechnic actions conducted by APHIS-WS personnel in these areas will create disturbance for the species that may alter their normal behavior.

a) Timing and Duration of Exposure

The proposed control of nest predators would likely occur during the light-footed clapper rail nesting season, although some of the work may also occur prior to the nesting season. Conducting predator-control activities prior to the nesting season is not only effective, but would also reduce the amount of work needed during the nesting season thereby reducing exposure. Predator control would be directed at areas that are occupied by nesting clapper rails. Frequency of activities may be up to several days per week. The exposure duration may be as long as the entire nesting season, and will be conducted annually (as funding permits) for the duration of this covered action.

b) Level of Exposure

The level of exposure describes the potential effects of the actions to the life stages of the species, the number of individuals, and the population as a whole. The specific activities conducted by APHIS for each category and their expected frequency of use are summarized in Appendix A-1. The frequency of activities that may be conducted daily includes site access, shooting, and live captures utilizing cage traps and padded foot-hold traps. The only activities conducted on a weekly basis involve lethal tools/techniques utilizing rodent traps. The frequency of all other remaining activities (with the exception of egg addling, oiling, and nest destruction) will be rare. The frequency of egg addling, oiling, and nest destruction will be infrequent.

The USFWS anticipates that adults, eggs, and chicks would be exposed to disturbance that may disrupt normal behaviors and would be exposed to humans travelling by foot and motorized vehicle.

These and all other actions considered are described below.

2. Response Analysis

a) Actions Resulting in Insignificant or Discountable Effects

The following activities are anticipated to result in discountable or insignificant effects to plovers for the reasons described below.

(1) Dispersal and Deterrent Devices – Lasers, Scarecrows, and Effigies

The frequency of the use of lasers, scarecrows and effigy use in light-footed clapper rail habitat is expected to be rare. Their use may provide attractive perching areas for predatory birds. However, these methods are designed to illicit avoidance behaviors in predatory birds that discourage them away from nesting areas. The likelihood of adverse effects is considered discountable.

(2) Live Capture Traps/Techniques

Traps designed to capture small animals, such as decoy or walk-in traps, may be placed in light-footed clapper rail habitat. These traps are generally baited with live birds to attract individuals of the same species. Because clapper rails avoid corvids, they are not expected to get close to or enter traps containing these predators. Also, the entrances to these traps will be large enough to allow clapper rails to enter and exit uninhibited. Thus, the likelihood of adverse effects to clapper rails from decoy or walk-in traps is considered discountable.

Devices, such as modified padded foot-hold traps, may also be used to capture avian predators and predatory mammals. Because the tension sets on foot-hold traps are set for larger target species, they would not be triggered by a bird. Therefore, the likelihood adverse effects of small animal traps on clapper rails is discountable.

Large animal traps will not generally be set in clapper rail habitat, and even if they were, clapper rails are too small to be affected. The likelihood of adverse effects to clapper rails from large traps is discountable.

(3) Inter-related and Interdependent Actions

(a) Disposal of Targeted Predators
All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods. Disposal will not occur at or near habitat areas. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take. The likelihood of adverse effects from this activity is discountable.

(b) Release or Rehabilitation of Avian Predators and Non-Target Wildlife
Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility. All unharmed non-target wildlife determined not to be a threat to protected species will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center until they can be released at a suitable location after the threatened or endangered species nesting season(s) has/have completed. There is a possibility that released avian predators could depredate on threatened or endangered species but the likelihood of adverse effects from this activity is discountable.

(c) Staging and Access

Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS activities do not generally require staging areas. APHIS-WS activities are primarily temporary as are any structures they place in the field. Such temporary structures are removed following operations. The likelihood of adverse effects from this activity is discountable.

(d) Night Vision, Spotlights and Calling Devices

Use of night vision optics is not perceptible to animals (including threatened and endangered species) in the surrounding environment. The likelihood of effects from this inter-related action is discountable.

Use of spotlights by APHIS-WS personnel will be cautiously used when in nesting/breeding areas. APHIS-WS personnel will also focus spotlights away from protected species whenever possible and assess for any behavioral responses that may indicate harassment and discontinue use if necessary. Effects from this inter-related action are anticipated to be insignificant.

When using calling devices, APHIS-WS personnel carefully consider locations of its use to prevent drawing predators through areas that may be occupied by the threatened or endangered species, and ensuring that there is availability of a safe backstop area for shooting downrange. Effects from this inter-related action are anticipated to be insignificant.

b) Actions Resulting in Not Likely Adverse Effects

(1) Shooting, Pyrotechnics, and Net Gun/Launchers

Selective shooting of avian or mammalian predators would be highly species selective. The protocols require APHIS-WS personnel to coordinate with landowners and species experts immediately prior to going into areas used by clapper rails to shoot corvids or conduct other control measures in clapper rail habitat. They will be given updated GPS locations of active nests and/or locations of broods to minimize the risk of accidentally stepping on nests. The likelihood of direct adverse effects to light-footed clapper rails from accidental shooting is discountable.

Use of pyrotechnics, shotguns, rifles, and net gun/launchers can be extremely loud when firing and this noise could adversely affect listed species as individuals react to the noise. Light-footed clapper rails reacting to noise disturbance by flushing may be exposed to predation, and extra energy expenditure. If this happens during the breeding season, eggs or chicks could be exposed to inclement weather, increased predation risk, or separated from adults, ultimately leading to loss of those eggs or chicks and failure of that breeding attempt. Repeated reaction to noise disturbance can result in exhaustion, nests being abandoned, chicks becoming separated from adults, and reproductive failure. If the noise is loud enough, permanent hearing damage could occur, reducing the likelihood of survival for that individual. We expect adverse effects from noise to be most dramatic closest to the firing weapon. The probability of adverse effects will decrease with distance as the volume attenuates and wind and wave noise masks the sound from the small arms.

Studies indicate that birds are resistant to permanent auditory damage and hearing loss from noise exposure when exposed to high-intensity impulse noise. Birds can tolerate continuous (up to 72 hours) exposure to noises up to 110 dB without experiencing hearing damage or permanent threshold shift. Continuous noise above 110 dB and impulse noise above 125 dB can result in hearing damage/loss. Temporary threshold shift (temporary loss of hearing that can last a few seconds to days), however, can occur from continuous noise levels between 93 and 110 dB (Dooling and Popper 2007).

Studies indicate an increase in noise of 3 to 10 dB corresponds to 30 to 90 percent reductions in alerting distances for wildlife (Barber *et al*. 2009), impairing their abilities to signal and listen, which are necessary for reproduction and survival (USFWS 2011). Additionally, studies of noise criteria suggest that noise levels above 80 to 85 decibels are disruptive to normal behavioral patterns in birds, such as foraging, breeding, egg incubation, and rearing of young (Transportation Noise Control Center 1997 in USFWS 2013b). Increased noise during nesting season could result in displacing birds from their nests, leaving eggs, young, and adults more susceptible to predation or environmental stress (for example, egg temperature changes and exposure to wind and blowing sand or soil that could result in burial of eggs).

Relative to the effects described above and application of a noise attenuation factor of 6.75 dB/doubling of distance from the source, light-footed clapper rails within varying distances of each device can be expected to experience adverse effects ranging from behavior disturbance to permanent hearing damage and mortality may also result from these effects. However, because the proposed project noise is expected to be delivered in intermittent impulses rather than for extended durations, and minimization measures for pyrotechnics and shooting would be employed, adverse effects from noise generated by these activities are not anticipated. Table A-2 in the appendix illustrates the estimated noise attenuation of distance for each device and relative expected effects to light-footed clapper rails.

c) Actions Resulting in Adverse Effects

(1) Human Presence and Travel

Human presence and travel of APHIS-WS personnel could have adverse effects to light-footed clapper rails by creating disturbance and altering their behavior. Clapper rail reactions to disturbance may vary with season; with both breeding and non-breeding seasons being critical times. Disturbance during the non-breeding season may primarily affect survival of adult and sub-adult rails. Existing information on human-related disturbance is limited. However, consensus is the species seems to tolerate human use of their habitat, provided such use does not result in habitat degradation or loss (USFWS 1985b). Therefore, the potential for adverse effects to occur via disturbance from human presence and travel by APHIS-WS personnel is not likely.

Since APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment (*i.e.*, dispersal and deterrent devices, live capture traps, and lethal tools, such as grid searches), there is the potential to step on, knock down or otherwise accidently crush an unknown nest. Close coordination with the site managers, biologists, and monitors will be necessary to minimize any effects to the light-footed clapper rails, nests, or broods. However, it is reasonably anticipated that travel by foot in saltmarsh areas may inadvertently injure or kill eggs or young chicks via crushing in areas where broods would be foraging.

Death of light-footed clapper rails by automobile strikes has been documented both on major roadways and within lightly travelled wildlife refuge areas (Martin 2000, pers. com., as cited in USFWS 2009b). This species prefers walking or running and seldom flies, and when it does fly, its flight is slow and labored and appears clumsy when landing (Eddleman and Conway 1998, p. 12). The locomotion characteristics of the light-footed clapper rail likely make this species susceptible to road kill deaths in areas where roads bisect or are near suitable habitat. Because vehicle travel will be restricted to established roads/paths, we do not anticipate nests with eggs to be crushed by vehicles. However, adults are at risk from strikes by vehicles.

d) Actions Resulting in Beneficial Effects

Besides habitat restoration, predator control is likely the most significant tool to significantly improving the survival and recovery of this species. Implementation of predator control programs have resulted in an increase of rail numbers, specifically at Seal Beach NWR. In 1986, the USFWS and the U.S. Navy began trapping and removing red foxes from Seal Beach NWR. The first red fox den on the refuge was found in 1980. A total of 59 foxes were removed during the first year of trapping in 1986. Over the next two years, 185 red foxes were removed and by 1989 the rail numbers rebounded to the highest levels recorded. Since that time, the rail numbers have fluctuated and are currently down again. The stimulus for the decline is unknown, but one possibility could be raptor predation (Zembal *et al*. 2008).

The following categories of activities, as described in the APHIS-WS Biological Assessment, are expected to contribute to recovery of the species and have beneficial effects:

- Physical Exclusion methods provide protection to the species by preventing predator access to nests, chicks, and adults, or provide hiding places/shelter to chicks, juveniles and adults.
- Dispersal and Deterrent Devices – these methods frighten or scare predators away from nesting areas enabling improved nest success and reproduction.
- Live Capture Traps/Tools and Lethal Tools/Techniques – these methods are designed to target specific animals predating on the threatened or endangered species of focus in the PDMTE. Removal of predators through these techniques reduces risk of the loss of individuals, and improves the likelihood of nest productivity for the threatened/endangered species of concern.

3. Summary of Effects to the Species

Based upon frequency of actions that are anticipated to be conducted, there is a likelihood that mortalities of young chicks and eggs may occur unintentionally in occupied areas where adults are tending to active nests. The specific activities that have a likelihood of causing mortalities is travel by foot or watercraft in saltmarsh areas that may inadvertently injure or kill eggs or young chicks via crushing/injury in areas where broods would be foraging. Light-footed clapper rails also are at particular risk from vehicle strikes in occupied areas.

Adults, eggs, and chicks are likely exposed to disturbance that may disrupt normal behaviors and would be exposed to humans travelling by foot, motorized vehicle, or watercraft. Adults, eggs, and chicks may also be exposed to disturbance occurring from loud noises generated from shooting activities. However, disturbance from human presence and noise is not expected to be at a level to indirectly result in lethal take or other adverse effects.

While there will be adverse effects to the species from some of the proposed predator damage management actions, we anticipate the program will result in a net overall benefit to the species for achieving recovery in the future.

E. Salt Marsh Harvest Mouse

1. Exposure and Analysis

a) Timing and Duration of Exposure

The exposure analysis presents the set of resources (species, populations, individuals, life stages or forms, or habitat elements) that are present in the action area and that are likely to be exposed to the action. These resources co-occur with the stressors caused by the activities APHIS-WS conducts in areas occupied by salt marsh harvest mice. This analysis provides a foundation for determining whether the action could result in jeopardy or adverse effects to the species.

APHIS-WS will be coordinating with resource owners, agencies, and surveyors to identify locations of pickleweed habitat prior to entering known occupied areas. Salt marsh harvest mice can still be exposed to impacts from APHIS-WS activities. It is reasonably certain that presence of APHIS –WS personnel and certain activities will create disturbance for the species that may alter their normal behavior.

b) Level of Exposure

The level of exposure describes the potential effects of the actions to the life stages of the species, the number of individuals, and the population as a whole. The specific activities conducted by APHIS for each category and their expected frequency of use are summarized in Appendix A-1. The frequency of activities that may be conducted daily includes site access, shooting, and live captures utilizing cage traps. The remaining activities not previously identified above will be conducted rarely, infrequently, not at all, or determined by APHIS-WS to have no effect.

The USFWS anticipates that adults would be potentially exposed to lethal crushing from APHIS-WS personnel travelling by foot in areas containing pickleweed. Adults and young may be exposed to disturbance by presence of APHIS-WS personnel in pickleweed habitat, or by loud noises generated by shooting or pyrotechnic activities that may disrupt normal behaviors.

These and all other actions considered are described below.

2. Response Analysis

a) Actions Resulting in Insignificant or Discountable Effects

(1) Dispersal and Deterrent Devices – Lasers, Scarecrows, and Effigies

The frequency of the use of lasers, scarecrows and effigies in salt marsh harvest mouse habitat is expected to be rare. Their use may provide attractive perching areas for predatory birds. However, these methods are designed to illicit avoidance behaviors in predatory birds that discourage them away from salt marsh harvest mouse-occupied areas. The likelihood of adverse effects is considered discountable.

(2) Live Capture Traps/Techniques

Traps designed to capture small animals, such as decoy or walk-in traps, may be placed in salt marsh harvest mouse habitat. These traps are generally baited with live birds to attract individuals of the same species. Because salt marsh harvest mice avoid corvids, they are not expected to get close to or enter traps containing these predators. Also, the entrances to these traps will be large enough to allow salt marsh harvest mice to enter and exit uninhibited. In addition, these methods will be used rarely. Thus, the likelihood of adverse effects to salt marsh harvest mice from decoy or walk-in traps is discountable.

Devices, such as modified padded foot-hold traps, may also be used to capture avian predators and predatory mammals. Because the tension sets on foot-hold traps are set for larger target species, they would not be triggered by salt marsh harvest mice. In addition, these traps will be used infrequently. Therefore, effects of small animal traps on salt marsh harvest mice are discountable.

Large animal traps will not generally be set in salt marsh harvest mice habitat, and even if they were, salt marsh harvest mice are too small to be affected.

The likelihood of adverse effects to salt marsh harvest mice from large traps is discountable.

(3) Lethal Tools/Techniques

(a) Egg Addling, Oiling, and Nest Destruction
Egg addling, oiling, or nest destruction is specific to avian predators and not rodents. The likelihood of adverse effects from this activity is discountable.

(4) Inter-related and Interdependent Actions

(a) Disposal of Targeted Predators
All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods. Disposal will not occur at or near habitat areas. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take. The likelihood of adverse effects from this activity is discountable.

(b) Release or Rehabilitation of Avian Predators and Non-Target Wildlife
Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility. All unharmed non-target wildlife determined not to be a threat to protected species will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center until they can be released at a suitable location after the threatened or endangered species nesting season(s) has/have completed. There is a possibility that released avian predators could depredate on threatened or endangered species but the likelihood of adverse effects from this activity is discountable.

(c) Staging and Access
Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS

activities do not generally require staging areas. APHIS-WS activities are primarily temporary as are any structures they place in the field. Such temporary structures are removed following operations. The likelihood of adverse effects from this activity is discountable.

(d) Night Vision, Spotlights and Calling Devices
Use of night vision optics is not perceptible to animals (including threatened and endangered species) in the surrounding environment. The effects of this inter-related action are discountable.

Use of spotlights by APHIS-WS personnel will be cautiously used when in pickleweed areas. APHIS-WS personnel will also focus spotlights away from protected species whenever possible and assess for any behavioral responses that may indicate harassment and discontinue use if necessary. The effects of this inter-related action are anticipated to be insignificant.

When using calling devices, APHIS-WS personnel carefully consider locations of its use to prevent drawing predators through areas that may be occupied by the threatened or endangered species, and ensuring that there is availability of a safe backstop area for shooting downrange. The effects of this inter-related action are anticipated to be insignificant.

b) Actions Resulting in Not Likely Adverse Effects

(1) Human Presence and Travel

Since APHIS-WS personnel will be operating in and around salt marsh harvest mouse-occupied areas (*i.e*., pickleweed habitat) deploying and monitoring equipment *(i.e*., dispersal and deterrent devices, live capture traps, and lethal tools), there is the potential to step on, knock down or otherwise accidently crush a mouse. Close coordination with the site managers, biologists, and monitors will be necessary to minimize any effects to mice. However, salt marsh harvest mice generally avoid human presence when detected. Therefore, the adverse effects of being crushed or injured by travel are not likely to occur.

Disturbance would result in temporary displacement of salt marsh harvest mice from protective cover and their territories/home ranges (through noise and vibrations). These disturbances would disrupt normal behavior patterns of breeding, foraging, sheltering, and dispersal, and could result in the displacement of salt marsh harvest mice from their territory/home ranges. Displaced harvest mice may have to compete for resources in occupied habitat, and may be more vulnerable to predators. Disturbance to females during the period of March through November may mean abandonment or failure of the current litter. Thus, displaced salt marsh harvest mice may experience increased predation, competition, mortality, and reduced reproductive success. However, species minimization measures employed by APHIS, including minimizing noise while in salt marsh harvest mouse habitat, will reduce adverse effects to an insignificant level.

(2) Pyrotechnics, Shooting, and Net Guns/Launchers

Selective shooting of avian or mammalian predators would be highly species-selective. The protocols require APHIS-WS personnel to coordinate with landowners and species experts immediately prior to going into areas used by salt marsh harvest mouse to shoot corvids or conduct other control measures. This activity is not expected to result in direct effects via accidental shooting of salt marsh harvest mice.

Use of pyrotechnics, shotguns, rifles can be extremely loud when firing, and this noise could adversely affect listed species as individuals react to the noise. Hearing loss, elevated stress hormone levels, and hypertension are documented to occur in animals beginning at noise exposure levels of 55 to 60 dB (Barber *et al*. 2009). No data were found on thresholds for hearing loss for mice; however, general data for mammals indicate that noise levels of 120 dB can result in permanent hearing damage, and levels at 95 dB can cause temporary hearing loss (NoiseQuest 2016).

Masking occurs when noise interferes with an animal's ability to perceive (detect, interpret, and/or discriminate) a sound. Masking is a significant problem for reproductive, territorial, and alarm messaging, and it affects the successful perception of motion, such as that produced by predators or footfall, which in turn may have effects on mouse survival. Studies have shown that a noise increase of 3 dB, which is just perceptible to humans, corresponds to a 50 percent loss of listening area[3] for wildlife. Noise increases of 3 to 10 dB correspond to 30 and 90 percent reductions in alerting distances (Barber *et al*. 2009), impairing their abilities to signal and listen, which are necessary for reproduction and survival (USFWS 2011). Studies on the effects of noise on mice reproduction have shown that exposure to noise at 70 to 90 dB for 1 hour each day during gestation decreased reproductive efficiency by decreasing live birth rates and increasing the number of stillborn pups. Additionally, mice exposed to noise ≥ 90 dB stopped nursing pups during the noise exposure (Rasmussen *et al*. 2009). Audiogenic stressors in mice have been linked to hypertension, cardiac hypertrophy, altered electrolyte metabolism, changed immune response, altered estrus cycles, decreased fertility, and an increase of prematurely terminated pregnancies (Rasmussen *et al.* 2009).

Relative to the effects described above and application of a noise attenuation factor of 6.75 dB/doubling of distance from the source, salt marsh harvest mice within varying distances of each device can be expected to experience

[3] The listening area is the active space of vocalization in which animals search for sounds (Barber *et al.* 2010).

effects ranging from reduced listening area and alerting distances to temporary or permanent hearing damage and mortality may also result from these effects. Because the proposed project noise is expected to be delivered in intermittent impulses rather than for extended durations, the potential adverse effects to reproductive efficiency and behavior from prolonged noise described above are not anticipated. Table A-3 in the appendix illustrates the estimated noise attenuation of distance for each device and relative expected effects to salt marsh harvest mice.

c) Actions Resulting in Adverse Effects

None anticipated.

d) Actions Resulting in Beneficial Effects

The following categories of activities, as described in the APHIS-WS Biological Assessment, are expected to contribute to recovery of the species and have beneficial effects:

- Physical Exclusion methods provide protection to the species by providing hiding places/shelter to juveniles and adults.
- Dispersal and Deterrent Devices – these methods frighten or scare predators away from occupied areas
- Live Capture Traps/Tools and Lethal Tools/Techniques – these methods are designed to target specific animals predating on the threatened or endangered species of focus in the PDMTE. Removal of predators through these techniques reduces risk of the loss of individuals, and improves the likelihood of productivity for the threatened/endangered species of concern.

3. Summary of Effects to the Species

When analyzing the type, intensity, and frequency of the various activities in combination with species-specific measures employed by APHIS-WS, we do not expect the proposed action to result in lethal take of the species. There may be some disturbance to the species from human presence/travel, pyrotechnics, and shooting activities. However, this disturbance is not expected to be at a level that would indirectly result in lethal take or harassment. In the context of removing/reducing predator impacts in occupied areas and supporting habitat, the predator damage management actions is anticipated to be beneficial to the species for achieving recovery in the future.

F. California Least Tern

1. Exposure and Analysis

The exposure analysis presents the set of resources (species, populations, individuals, life stages or forms, or habitat elements) that are present in the action area and that are likely to be exposed to the action. These resources co-occur with the stressors caused by the activities APHIS-WS conducts in areas occupied by plovers. This analysis provides a foundation for determining whether the action could result in jeopardy.

Even though APHIS-WS will be coordinating with resource owners, agencies, and surveyors to obtain known nest locations prior to entering known nesting areas, new nests could be initiated, or nests could go undetected and be exposed to impacts from APHIS-WS activities. Thus, it is reasonably certain that a nest could be accidentally stepped on.

It is reasonably certain that presence of APHIS –WS personnel will create disturbance for the species, particularly during nesting periods that may alter their normal behavior.

It is also reasonably certain that shooting and pyrotechnic actions conducted by APHIS-WS personnel in these areas will create disturbance for the species that may alter their normal behavior.

a) Timing and Duration of Exposure

The proposed control of nest predators would likely occur during the nesting season; although, some of the work may also occur prior to the nesting season. Conducting predator-control activities prior to the nesting season is not only effective, but would also reduce the amount of work needed during the nesting season, thereby reducing exposure. Predator control would be directed at areas that are occupied by nesting least terns. Frequency of activities may be up to several days per week. The exposure duration may be as long as the entire nesting season, and will be conducted annually (as funding permits) for the duration of this covered action.

b) Level of Exposure

The level of exposure describes the potential effects of the actions to the life stages of the species, the number of individuals, and the population as a whole. The specific activities conducted by APHIS for each category and their expected frequency of use are summarized in Appendix A-1. The frequency of activities that may be conducted daily includes site access, shooting, live captures utilizing cage traps and padded foot-hold traps, and lethal captures utilizing rodent traps. Activities conducted on a weekly basis include live captures utilizing bal-chatri traps, pole traps, and Swedish goshawk traps. The frequency of all other remaining activities will be infrequent, rare, not conducted at all, or determined by APHIS-WS to have no effect.

The USFWS anticipates that adults, eggs, and chicks would be exposed to disturbance that may disrupt normal behaviors and would be exposed to humans travelling by foot and motorized vehicle.

These and all other actions considered are described below.

2. Response Analysis

a) Actions Resulting in Insignificant or Discountable Effects

(1) Live Capture Traps/Techniques – Cage and Padded-jaw Foot-hold Traps

Traps designed to capture small animals, such as decoy or walk-in traps, may be placed in California least tern habitat. These traps are generally baited with live birds to attract individuals of the same species. Because California least tern avoid corvids, they are not expected to get close to or enter traps containing these predators. Also, the entrances to these traps will be large enough to allow California least tern to enter and exit uninhibited. Thus, the likelihood of adverse effects to California least terns from decoy or walk-in traps is considered discountable.

Devices, such as modified padded foot-hold traps, may also be used to capture avian predators and predatory mammals. Because the tension sets on foot-hold traps are set for larger target species, they would not be triggered by a bird. Thus, adverse effects for padded foot-hold traps are discountable.

Large animal traps will not generally be set in clapper rail habitat, and even if they were, clapper rails are too small to be affected. The likelihood of adverse effects to clapper rails from large traps is discountable.

(2) Inter-related and Interdependent Actions

(a) Disposal of Targeted Predators

All non-native mammalian predators, other than dogs and cats, will be euthanized using approved humane methods. Disposal will not occur at or near habitat areas. Euthanized animals are disposed of by incineration or burial at approved facility to avoid secondary hazards. The use of euthanasia drugs requires syringe administration to the target animal, so there is no issue with non-target take. The likelihood of adverse effects from this activity is discountable.

(b) Release or Rehabilitation of Avian Predators and Non-Target Wildlife

Target and non-target predators that are injured during trapping will be treated on a case-by-case basis. These animals may be euthanized or taken to an approved rehabilitation/veterinary care facility depending on species and extent of injuries.

All domestic or feral dogs and cats, when feasible, will be taken to an approved shelter facility operated by a cooperating local unit of government, humane society or a veterinary care facility. All unharmed non-target wildlife determined not to be a threat to protected species will be immediately released near the capture site or in rare case-by-case scenarios approved by the CDFW at another suitable location. All raptors and other avian predators that are live captured and not euthanized on site will be transferred to a licensed/permitted rehabilitation/holding center until they can be released at a suitable location after the threatened or endangered species nesting season(s) has/have completed. There is a possibility that released avian predators could continue to depredate on threatened or endangered species but the likelihood of adverse effects from this activity is discountable.

(c) Staging and Access

Access will be through areas that are normally open for other reasons. When accessing areas not open to the public, it will be at the request of land managers and part of their administrative procedures. APHIS-WS activities do not generally require staging areas. APHIS-WS activities are primarily temporary as are any structures they place in the field. Such temporary structures are removed following operations. The likelihood of adverse effects from these activities is discountable.

(d) Night Vision, Spotlights and Calling Devices

Use of night vision optics is not perceptible to animals (including threatened and endangered species) in the surrounding environment. Effect from this inter-related action are discountable.

Use of spotlights by APHIS-WS personnel will be cautiously used when in nesting/breeding areas. APHIS-WS personnel will also focus spotlights away from protected species whenever possible and assess for any behavioral responses that may indicate harassment and discontinue use if necessary. Effects from this inter-related action are anticipated to be insignificant.

When using calling devices, APHIS-WS personnel carefully consider locations of its use to prevent drawing predators through areas that may be occupied by the threatened or endangered species, and ensuring that there is availability of a safe backstop area for shooting downrange. The effects of this inter-related action are anticipated to be insignificant.

b) *Actions Resulting in Not Likely Adverse Effects*

(1) Shooting, Pyrotechnics, and Net Guns/Launchers

Selective shooting of avian or mammalian predators would be highly species-selective. The protocols require APHIS-WS personnel to coordinate with landowners and species experts immediately prior to going into areas used by least terns to shoot corvids or conduct other control measures in least tern habitat. They will be given updated GPS locations of active nests and/or locations of broods to minimize the risk of accidentally stepping on nests. This activity is not expected to result in direct adverse effects via accidental shooting of California least terns.

Use of pyrotechnics, shotguns, and rifles can be extremely loud when firing and this noise could adversely affect listed species as individuals react to the noise. California least terns reacting to noise disturbance by flushing may be exposed to predation, and extra energy expenditure. If this happens during the breeding season, eggs or chicks could be exposed to inclement weather, increased predation risk, or separated from adults, ultimately leading to loss of those eggs or chicks and failure of that breeding attempt. Repeated reaction to noise disturbance can result in exhaustion, nests being abandoned, chicks becoming separated from adults, and reproductive failure. If the noise is loud enough, permanent hearing damage could occur, reducing the likelihood of survival for that individual. We expect adverse effects from noise to be most dramatic closest to the firing weapon. The probability of adverse effects will decrease with distance as the volume attenuates and wind and wave noise masks the sound from the small arms.

Studies indicate that birds are resistant to permanent auditory damage and hearing loss from noise exposure when exposed to high-intensity impulse noise. Birds can tolerate continuous (up to 72 hours) exposure to noises up to 110 dB- without experiencing hearing damage or permanent threshold shift. Continuous noise above 110 dB- and impulse noise above 125 dB- can result in hearing damage/loss. Temporary threshold shift (temporary loss of hearing that can last a few seconds to days), however, can occur from continuous noise levels between 93 and 110 dB- (Dooling and Popper 2007).

Studies indicate an increase in noise of 3 to 10 dB- corresponds to 30 to 90 percent reductions in alerting distances for wildlife (Barber *et al*. 2009), impairing their abilities to signal and listen, which are necessary for reproduction and survival (USFWS 2011). Additionally, studies of noise criteria suggest that noise levels above 80 to 85 decibels are disruptive to normal behavioral patterns in birds, such as foraging, breeding, egg incubation, and rearing of young (Transportation Noise Control Center 1997 in USFWS 2013). Increased noise during nesting season could result in displacing birds from their nests, leaving eggs, young, and adults more susceptible to predation or environmental stress (for example, egg temperature changes, and exposure to wind and blowing sand or soil that could result in burial of eggs).

Relative to the effects described above and application of a noise attenuation factor of 6.75 dB/doubling of distance from the source, California least terns within varying distances of each device can be expected to experience effects ranging from behavior disturbance to permanent hearing damage; mortality may also result from these effects. However, because the proposed project noise is expected to be delivered in intermittent impulses rather than for extended durations, and because minimization measures for pyrotechnics and shooting would be employed, the potential adverse effects from noise generated by these activities are not anticipated. Table A-2 in the appendix illustrates the estimated noise attenuation of distance for each device and relative expected effects to California least terns.

c) Actions Resulting in Adverse Effects

(1) Human Presence, Travel, and Grid Searches

(a) Crushing or Injuring of Nests, Young Chicks, or Adults

Since APHIS-WS personnel will be operating in and around nesting areas deploying and monitoring equipment (*i.e.*, dispersal and deterrent devices, live capture traps, and lethal tools, such as grid searches), there is the potential to step on, knock down or otherwise accidently crush an unknown nest. Close coordination with the site managers, biologists, and monitors will be necessary to minimize any effects to the California least tern nests, or broods. However, it is reasonably anticipated that travel by foot in nesting areas may inadvertently injure or kill eggs or young chicks via crushing in areas where broods would be foraging.

Grid searches for snakes have similar, but potentially increased, risk to cause direct effects on least terns as site access and human presence. If APHIS-WS personnel will be operating in and around nesting areas conducting the search, there is the potential to step on or otherwise accidently crush a nest.

(b) Disturbance

California least tern reactions to disturbance may vary with season. Repeated disturbance of California least tern breeding sites by human activities can have substantial effects on a colony's reproductive success resulting in nest failure, re-nesting, and site abandonment (Massey and Fancher 1989). Many California least tern colonies are subjected to ongoing disturbance from human activity as a result of competing land uses. It is reasonably anticipated that human disturbance associated with the proposed predator management program will adversely affect the California least tern as described above.

(2) Live Capture Traps/Techniques – Pole Traps

Between 1989 and 2006, pole traps deployed by APHIS-WS were responsible for accidental takings of California least terns. Afterwards, APHIS-WS refined their deployment to be more selective. As a result, no California least terns have been accidentally captured since 2006. However, the potential for non-target capture/kill of adults still exists.

(3) Rodent Traps (snap-type only)

APHIS-WS deploys snap traps in areas where rodents frequent and not near areas containing least tern nests. Regardless, rodent snap traps set to control rodents predating on the California least tern nests have the potential to inadvertently capture/kill adults or chicks. There were two instances in 1998 and 2003 where least tern fledglings were inadvertently captured by rodent trap in areas away from nesting areas in rip-rap. APHIS-WS has modified their deployment in these rip-rap areas utilizing wooden stakes and placing them in less accessible areas to fledglings within the rip-rap. However, the potential for non-target capture/kill of adults and chicks still exists.

d) Actions Resulting in Beneficial Effects

Least tern breeding success can be affected by predation events (Elliot *et al.,* 2007). Both avian and terrestrial predators take eggs and chicks, particularly when adults leave the nest to mob predators (Burger 1989; Thompson *et al.* 1997). Predation is an important source of reduced fecundity and sometimes total reproductive failure of least tern colonies (Grover and Knopf 1982, Burger 1984, Rimmer and Deblinger 1992, Koenen *et al*. 1996). A decline in California least tern nesting pairs and the lowest productivity observed since 1976 was due in part due to predation (Keane 2001). Common ravens (*Corvus corax*) are among the most potentially detrimental predators on eggs of California least terns (Linz *et al*. 1990, Belluomini 1991). Since 1988, California least terns at Camp Pendleton have benefitted greatly from aggressive predator control that has emphasized lethal techniques, including poisoning and shooting (Butchko and Small 1992). Most management efforts in least tern colonies have concentrated on reducing predation and likely has contributed to preventing reductions in nesting success and productivity.

The following categories of activities, as described in the APHIS-WS Biological Assessment, are expected to contribute to recovery of the species and have beneficial effects:

- Physical Exclusion methods provide protection to the species by preventing predator access to nests, chicks, and adults, or provide hiding places/shelter to chicks, juveniles and adults.
- Dispersal and Deterrent Devices – these methods frighten or scare predators away from nesting areas enabling improved nest success and reproduction.
- Live Capture Traps/Tools and Lethal Tools/Techniques – these methods are designed to target specific animals predating on the threatened or endangered species of focus in the PDMTE. Removal of predators through these techniques reduces risk of the loss of individuals, and improves the likelihood of nest productivity for the threatened/endangered species of concern.

3. Summary of Effects to the Species

Based upon frequency of actions that are anticipated to be conducted, there is a likelihood that mortalities of adults, young chicks, and eggs may occur unintentionally in occupied areas where adults are tending to active nests. The specific activities that have a likelihood of causing mortalities include 1) physical crushing/injuring of adults, young chicks, or eggs from travel by foot or vehicle, 2) physical crushing/injuring of adults, young chicks, or eggs from grid searches, 3) physical injury/death of foraging adults from accidental capture in rodent snap traps, and 4) physical injury/death of adults from accidental capture in pole traps.

We anticipate that foot travel, vehicle use, and loud noise generated from shooting and use of pyrotechnics in/near nesting areas is likely to disrupt the normal behavior some adults and their young. However, this disturbance is not expected to be at a level that would indirectly result in lethal take or harassment.

While there will be adverse effects to the species from some of the proposed predator damage management actions, we anticipate the program will result in a net overall benefit to the species for achieving recovery in the future.

VI. Cumulative Effects

Cumulative effects are those effects of future State or private activities, not involving federal activities that are reasonably certain to occur within the action area of the particular federal action subject to consultation pursuant to section 7 of the Act. Cumulative effects do not include additional future federal activities that are physically located within the action area; they require separate consultation pursuant to Section 7 of the Act. The USFWS is not aware of specific projects that might affect the California least tern, western snowy plover, California clapper rail, and light-footed clapper rail in the action area that are currently under review by State, county, or local authorities.

Section 9 of ESA protects threatened and endangered species from unlawful take. To avoid section 9 violations, non-federal projects resulting in take of the six ESA-listed species in this Biological Opinion require approval of the USFWS through the section 10(a)(l)(B) permit process. Projects that may result in adverse effects to the six ESA-listed species on private (non-federal) land are anticipated to fall under the purview of existing habitat conservation plans and associated incidental take permits.

VII. Jeopardy Conclusion

When determining whether a proposed action is likely to jeopardize the continued existence of a species, we are required to consider whether the action would "reasonably 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 CFR 402.02).

USFWS reviewed the following information as part of its jeopardy analysis:

- current status of four endangered or threatened species that may be adversely affected by the proposed action (western snowy plover, California clapper rail, light-footed clapper rail, and California least tern)
- the environmental baseline for the project area
- the effects of the proposed action, and
- the cumulative effects

It is the USFWS's biological opinion that implementation of PDMTE activities as proposed in the APHIS-WS's biological assessment is not likely to jeopardize the continued existence of the western snowy plover, California clapper rail, light-footed clapper rail, or California least tern.

The USFWS has reached this conclusion based on the following:

1. APHIS-WS will implement actions identified in this document to minimize or avoid adverse effects to western snowy plover, California clapper rail, light-footed clapper rail, and California least tern.
2. No western snowy plover, California clapper rail, light-footed clapper rail, and California least tern habitat is anticipated to be disturbed.

VIII. Incidental Take Statement

Section 9 of the Act, as amended, prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is defined to mean any an act which actually kills or injures fish or wildlife. Such an act 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 (50 CFR § 17.3). Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to, and not the purpose of, the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

In June 2015, the USFWS finalized new regulations implementing the incidental take provisions of section 7(a)(2) of the Act. The new regulations also clarify the standard regarding when the USFWS formulates an Incidental Take Statement [50 CFR 402.14(g)(7)], from "... if such take may occur" to "...if such take is reasonably certain to occur." This is not a new standard, but merely a clarification and codification of the applicable standard that the USFWS has been using and is consistent with case law. The standard does not require a guarantee that take will result, only that the USFWS establishes a rational basis for a finding of take. The USFWS continues to rely on the best available scientific and commercial data, as well as professional judgment, in reaching these determinations and resolving uncertainties or information gaps.

The USFWS hereby incorporates by reference the species-specific avoidance and minimization measures proposed by APHIS-WS from the *Project Description (APHIS-WS BA pages 28, 29, 32, 33, 36, 40, 43, 44, and 46)* into this incidental take statement as part of the terms and conditions to be applied to future appended actions, as appropriate. Terms and conditions that are specific to APHIS-WS PDMTE actions are non-discretionary and must be implemented by APHIS-WS, so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply.

A. Amount or Extent of Take Anticipated

In the accompanying biological opinion, the USFWS determined that the proposed actions are not likely to adversely affect the marbled murrelet or salt marsh harvest mouse. Therefore, take is not anticipated. This determination is based in part on the implementation of minimization measures detailed in this BO and the BA provided by APHIS-WS with their request for consultation and subsequent discussions during the consultation period.

1. Western Snowy Plover

Based on the results presented in the "Effects of the Action" section above, USFWS anticipates three snowy plover nests, including eggs and non-mobile chicks, and one juvenile chick may be directly taken, over the ten-year life of this BO, due to accidental destruction from foot travel, vehicle travel, or grid searches. Additionally, USFWS anticipates one individual (either adult or juvenile) may be directly taken, over the ten-year life of this BO, due to accidental capture in a rodent snap trap. Amount of take will be monitored through the Reporting Requirement below.

2. California Clapper Rail

Based on the results presented in the "Effects of the Action" section above, USFWS anticipates two California clapper rail nests may be directly taken, over the ten-year life of this BO, due to accidental destruction from foot travel, vehicle travel, or watercraft travel. Amount of take will be monitored through the Reporting Requirement below.

3. Light-footed Clapper Rail

Based on the results presented in the "Effects of the Action" section above, USFWS anticipates two light-footed clapper rail nests may be directly taken, over the ten-year life of this BO, due to accidental destruction from foot travel, vehicle travel, or watercraft travel. We also anticipate one adult light-footed clapper rail would be directly taken as a result of a vehicle strike. Amount of take will be monitored through the Reporting Requirement below.

4. California Least Tern

Based on the results presented in the "Effects of the Action" section above, USFWS anticipates three California least tern nests, including eggs and non-mobile chicks, and one juvenile chick may be directly taken over the ten-year life of this BO, due to accidental destruction from foot travel, vehicle travel, or grid searches. Additionally, USFWS anticipates one individual (either adult or juvenile) may be directly taken over the ten-year life of this BO, due to accidental capture in a rodent snap trap. USFWS also anticipates one adult individual may be directly taken over the ten-year life of this BO, due to accidental capture in a pole trap. Amount of take will be monitored through the Reporting Requirement below.

B. Effect of the Take

1. Western Snowy Plover

In the accompanying biological opinion, the USFWS determined that this level of anticipated take is not likely to jeopardize the continued existence of the western snowy plover. This determination is based in part on the implementation of minimization measures detailed in this BO and the BA provided by APHIS-WS with their request for consultation and subsequent discussions during the consultation period.

2. California Clapper Rail

In the accompanying biological opinion, the USFWS determined that this level of anticipated take is not likely to jeopardize the continued existence of the California clapper rail. This determination is based in part on the implementation of minimization measures detailed in this BO and the BA provided by APHIS-WS with their request for consultation and subsequent discussions during the consultation period.

3. Light-footed Clapper Rail

In the accompanying biological opinion, the USFWS determined that this level of anticipated take is not likely to jeopardize the continued existence of the light-footed clapper rail. This determination is based in part on the implementation of minimization measures detailed in this BO and the BA provided by APHIS-WS with their request for consultation and subsequent discussions during the consultation period.

4. California Least Tern

In the accompanying biological opinion, the USFWS determined that this level of anticipated take is not likely to jeopardize the continued existence of the California least tern. This determination is based in part on the implementation of minimization measures detailed in this BO and the BA provided by APHIS-WS with their request for consultation and subsequent discussions during the consultation period.

IX. Reasonable and Prudent Measures

The USFWS believes that the following Reasonable and Prudent Measures (RPMs) with Terms and Conditions stated below or incorporated by reference are necessary and appropriate to minimize the incidental take for ongoing actions and may be relevant for future actions to be appended to this biological opinion. In order to be exempt from the prohibitions of section 9 of the Act, APHIS-WS, or other jurisdictional federal agency, must comply with RPMs as implemented by the Terms and Conditions.

1. APHIS-WS shall implement measures to minimize injury or mortality of western snowy plover (*Charadrius nivosus nivosus),* California clapper rail (*Rallus obsoletus beldingi*)*,* light-footed clapper rail (*Rallus obsoletus levipes*), and California least tern *(Sterna antillarum browni*) due to PDMTE activities.

2. APHIS-WS shall implement measures to minimize disturbance created from PDMTE activities within project areas.

3. APHIS-WS shall implement measures to ensure compliance with the reasonable and prudent measures, terms and conditions, reporting requirements, and reinitiation requirements in this BO.

X. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of ESA, APHIS-WS must fully comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure Number 1, APHIS-WS shall fully implement the following terms and conditions to minimize injury or mortality to western snowy plover (*Charadrius nivosus nivosus),* California clapper rail (*Rallus obsoletus beldingi*)*,* light-footed clapper rail (*Rallus obsoletus levipes*), and California least tern *(Sterna antillarum browni*):

    a. APHIS-WS personnel implementing PDMTE activities shall have training or experience in field identification of the above species, including characteristics of nests, eggs, or burrows to minimize accidental crushing or injury by personnel or vehicles.
    b. APHIS-WS personnel will be trained in the application of firearms in accordance with WS directive 2.615 (WS Firearms Use and Safety) and requires positive identification of target animal, minimizing the chance of killing non-target animals.
    c. Precautions will be taken by APHIS-WS personnel to limit harm to species by establishing survey routes that incorporate existing roads, levees, and boardwalks whenever possible.
    d. For California least tern and western snowy plover areas, APHIS-WS will house snap traps in elevated stations or areas otherwise inaccessible to chicks, but in immediate proximity to nesting areas (*e.g.*, rip rap) utilizing wooden stakes (or other appropriate method) and place them in less accessible areas for foraging adults and juveniles.
    e. For California least tern areas, APHIS-WS will set tension settings on pole traps to minimize the possibility of capture or injury to a California least tern.

2. To implement Reasonable and Prudent Measure Number 2, APHIS-WS shall fully implement the following terms and conditions to minimize disturbance created from PDMTE activities within project areas:

    a. Western Snowy Plover
        i. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding plovers.

ii. When entering a nesting colony, activities shall be conducted as unobtrusively as possible and with the least amount of disturbance to the colony (Special Terms and Conditions for PRBO Permit 2001). Visits to trap sites near nests will be limited to minimize potential harassment and to minimize attracting other predators. Visits to control sites will be done in cooperation with biologists monitoring the protected nests to best avoid disturbing incubating adult shorebirds.
iii. APHIS-WS attempts to minimize disturbance to nesting western snowy plovers during certain climatic conditions, such as high wind, extreme cold and extreme heat (Special Terms and Conditions for PRBO Permit 2001).
iv. The distance between trap sites and snowy plover nests will be as great as possible to eliminate or minimize any visual disturbance to the nests, yet still accomplish the specific predator control objective.
v. Hazing with pyrotechnics will be used only beyond 250 feet from a known Western snowy plover nest.

b. California Clapper Rail
   i. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding rails.
   ii. If boats are required for marsh access, the speed of the boat will be reduced when approaching the marsh (Special Terms and Conditions for PRBO Permit 2001).
   iii. Disturbance to rails will be minimized to the maximum extent possible during the breeding season (Special Terms and Conditions for PRBO Permit 2001).
   iv. All personnel will keep talking and other noise to a minimum near the marsh to reduce disturbance (USFWS 2016).
   v. If California clapper rail nests are encountered, the observers will immediately leave the vicinity of the nest, being careful not to disturb the nest in any way. If adult California clapper rail or chicks are encountered, observers will carefully move away from the birds if they are giving alarm calls or otherwise appear agitated (USFWS 2016).
   vi. Hazing with pyrotechnics will be used only beyond 250 feet from a known California clapper rail nest.

c. Light-Footed Clapper Rail
   i. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding rails.
   ii. If boats are required for marsh access, the speed of the boat will be reduced when approaching the marsh (Special Terms and Conditions for PRBO Permit 2001).

iii. Disturbance to rails will be minimized to the maximum extent possible during the breeding season (Special Terms and Conditions for PRBO Permit 2001).
iv. Hazing with pyrotechnics will be used only beyond 250 feet from a known light-footed Clapper rail nest.

d. California Least Tern
    i. APHIS-WS abides by restrictions in place to minimize disturbance to nesting terns. For example, if the substrate is extremely hot, or conversely, if ambient temperature is below 65°F, care is taken to insure that nesting birds do not leave for more than 15 minutes (Elliott *et al*. 2007).
    ii. APHIS-WS generally avoids entry into the colonies unless there is a need to inspect for predation or predator sign, or to remove a particular predator from inside the colony. As often as possible, APHIS-WS attempts to coordinate with the site monitors and enter the colony with them, so as to minimize disturbance. APHIS-WS completes its activities as quickly as possible to reduce disturbance.
    iii. Caution will be exercised when conducting predator damage management operations around nesting sites to minimize disturbance to breeding terns.
    iv. When entering a nesting colony, activities shall be conducted as unobtrusively as possible and with the least amount of disturbance to the colony (Special Terms and Conditions for Point Reyes Bird Observatory (PRBO) Permit 2001).
    v. Visits to trap sites near nests will be limited to minimize potential harassment and to minimize attracting other predators.
    vi. Visits to control sites will be done in cooperation with biologists monitoring the protected nests to best avoid disturbing incubating adult shorebirds.
    vii. Hazing with pyrotechnics will be used only beyond 250 feet from a known California least tern nest.

3. To implement Reasonable and Prudent Measure Number 3, APHIS-WS shall fully implement the following terms and conditions to ensure compliance with the reasonable and prudent measures, terms and conditions, reporting requirements, and reinitiation requirements in this BO.

    a. By June 1st of each year, the APHIS-WS will submit an annual report (January 1st to December 31st) to the USFWS Pacific Southwest Regional Office that summarizes the projects that were implemented by the PDMTE under this programmatic consultation from the prior year.

    b. This annual report will detail (i) dates that predator control projects occurred; (ii) a location map of projects implemented under the PDMTE, (iii) the type of predator control methods that were deployed along with frequency of deployment (as specified in the BA; Table A-1), (iv) pertinent qualitative information concerning the success in meeting Minimization Measures with an explanation of failure to meet such measures, if any; (v) known project effects on listed species, if any; (vi) occurrences of incidental take of listed species, if any; (vii) and other pertinent information.

c. The USFWS will review the projects to determine if future activities for a certain project area should undergo a separate section 7 consultation and provide the rationale within 30 days. These projects are those that are determined to have take that would exceed the amount allowed, or that may affect species not covered under this Programmatic Biological Opinion.

d. For projects that APHIS-WS determines are emergency actions, the USFWS should be notified and any take of federally endangered and threatened species will be reported to the USFWS within 14 days.

e. APHIS-WS will meet with the USFWS by June 30th to review the annual report. This annual report is to ensure that indirect effects are not greater than may be anticipated and/ or to ensure that minimization measures included are feasible and allow alternative measures. The measures set forth are not exhaustive, and in cases may be counterproductive.

XI. Monitoring Requirements

As described under Term and Condition 3a, APHIS- WS shall submit an annual report of PDMTE activities for this proposed action by June 1st summarizing the previous year's field work. This annual report will also include a 10-year running total of incidental captures of western snowy plover (*Charadrius nivosus nivosus),* California clapper rail (*Rallus obsoletus beldingi*)*,* light-footed clapper rail (*Rallus obsoletus levipes*), and California least tern *(Sterna antillarum browni*).

XII. Reinitiation Notice

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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XIV. APPENDIX

Table A-1. Typical methods and location/settings for control of target species.

Table A-2. Noise attenuation of distance for each proposed auditory device and expected effects to western snowy plovers, California clapper rails, light-footed clapper rails, and California least terns.

Table A-3. Noise attenuation of distance for each proposed auditory device and expected effects to salt marsh harvest mice.

Table A-1. Typical methods and location/settings for control of target species.

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
Physical Exclusion				
Electric fencing	• Mammal (medium to large)	to prevent site specific predation	Recommended only.	Recommended only.
Barrier fencing	• Mammal	to prevent site specific predation	Recommended only.	Recommended only.
Barricades	• Mammal (small to large)	Exclude or prevent predator access to T&E occupied areas	Recommended only.	Recommended only.
Surface coverings	• Birds • Mammal	to provide hiding places for T&E species and decrease the success rate of detection by predators.	Recommended only.	Recommended only.
Dispersal & Deterrent Devices				
Pyrotechnics	• Raptors	To disperse a foraging predator from an area used T&E species.	MAMU – not used SNPL – weekly CACL – rare LFCL – rare LETE – weekly SMHM – rare	Typically directed away from the T&E species area and behind the foraging raptor to drive the predator farther from the site.
Lasers	• Birds	To elicit a flight response from target birds which disperses them from the area.	Rare.	Used under low-light conditions (*i.e.*, sunset through dawn). Most effective with gulls, vultures, and crows. Application limited near airfields due to FAA regulations and to

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
				intermittent frequency. Birds habituate to this technique if applied frequently.
Dispersal & Deterrent Devices (continued)				
Scarecrows & Effigies	• Birds	Used to deter birds from using a specific perch or roost.	Rare, except for LETE (infrequent).	Used to protect nesting colonies or individual nests from ravens, crows, jays, pigeons, & gulls
Live-capture Traps/Tools				
Cage traps	• Birds • Mammals	Capture and removal	Daily, except for MAMU (rare).	Effective for capturing peridomestic species. Often used near residential areas where capture of domestic species is more likely. Can be paired with euthanasia for target species or release/transfer of custody for non-target species, such as free roaming cats.
Padded-jaw foot hold traps	• Birds-Corvids, Gulls, Vultures & Raptors • Mammals	Capture and removal	MAMU - rare SNPL – daily CACL – infrequent LFCL – daily LETE - daily SMHM - infrequent	Set in the travel corridor of a predator. Trap size, adjustable pan tension, and placement relative to an animal's travel pattern can be used to make this a very target specific tool. Application in CA limited to public safety and T&E protection. Use often confined to areas not visible to or frequently visited by the public.
Catch poles	• Mammals	Capture and removal	Rare, except in LETE (infrequent).	Used to capture partially confined target species (*i.e.*, removal of feral dogs from within a fenced area or raccoon from inside a culvert.) Limited applications in T&E protection but in certain circumstances the most effective and safe tool available.
Pole traps	• Birds – Perching		MAMU – rare	Used to capture perching raptors foraging on T&E sites. This technique is most effective

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
	raptors, corvids, gulls, and terns.	Capture and removal or possible relocation	SNPL – daily CACL – rare LFCL – rare LETE – daily	when perches are limited improving the chances of a raptor deciding to use the trap as a perch. Once the trap is triggers, the device is designed to slide down a rod into an enclosed box. This limits the visual disturbance of the trapped animal reducing the chance of attracting corvids/gulls and minimizing stress to the T&E species being protected.
Foot/leg snares	• Mammals (small to large size)	Capture and removal.	Rare, except for MAMU (not used)	Typically set in travel corridors used by bobcat, coyote, fox, and raccoon that are found to be predating on T&E species.
Live-capture Traps/Tools (continued)				
Bow nets	• Birds – corvids, gulls, shrikes & raptors	Capture and removal or possible relocation	Rare	A spring or remotely triggered trap set in an area of open ground where raptors are known to forage. Can be baited with live lure or attractive material (*i.e.*, foil for gulls/corvids.) Remote triggered when desired target species is within the capture zone of the trap.
Decoy traps	• Birds	Capture and removal or possible relocation	Rare	Larger cage style traps with members of same or similar species enclosed as decoys. Water and food is provided and a funnel or other one-way entrance is used to allow free-roaming birds to enter. Typically used for starlings and pigeons, but are also effective at capturing kestrels and other bird hunting raptors.
Drop nets	• Birds	Capture and removal or possible relocation		Limited applications for T&E protection. Small versions could be used for ravens, gulls or owls. Typically this technique would be performed in an area away from the T&E site after a predator or group of predators is

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
				identified and a pattern of activity is observed. (*i.e.*, flocking gulls or a raptor known to perch/roost in a specific tree.)
Cannon/rocket nets	• Birds- Gulls	Capture and removal	Rare, except for LETE and SMHM (not used)	Set in a flat open area for captures of groups of birds. For T&E protection this could involve a baited set for gulls in an area with increased predation. While this technique has not been used for corvids, it could be used for crows if the right circumstances happened.
Nest box traps	• Birds	Capture and removal or possible relocation	Rare, except for LETE and SMHM (not used)	Used in capturing local breeding and post breeding European Starlings and other targeted secondary cavity nesting birds
Nest/walk-in traps	• Birds	Capture and removal or possible relocation	Rare, except for LETE and SMHM (not used)	Used in capturing ground nesting birds, such as cormorants, ducks, geese, and ground feeding birds, including pigeons and doves
Mist nets	• Birds	Capture and removal or possible relocation	Rare	Typically used in travel corridors for passive capture of passerine birds. Could be in T&E protection used for corvids, small raptors and owls.
Net guns/launchers	• Birds & mammals	Capture and removal or possible relocation	Rare, except for LETE and SMHM (not used)	Manual and remote versions are made. Manual versions are targeted by the applicator and propel a small net over an individual animal. Remote units are ground set and triggered by hand from a distance when the target animal approaches the unit. Short range of this method limits application.

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
Dho-gazza traps	• Birds	Capture and removal or possible relocation	Rare	A mist net strung between two poles typically using an owl as a lure to elicit a territorial response from a target raptor. Commonly used near raptor nests or known perch sites. Useful for capture of northern harriers.
Live-capture Traps/Tools (continued)				
Drift Fencing	• Reptiles	Capture and lethal removal		Limited to southern California least tern colonies and possible Snowy plover applications
Funnel Traps	• Reptiles	Capture and lethal removal	LETE- infrequent; SNPL & LFCR- rare; MAMU/CACL/SMHM – not used .	Limited to southern California least tern colonies and possible Snowy plover and Light-footed clapper rail applications
Tube Traps	• Reptiles	Capture and lethal removal	Rare, except LETE (infrequent) and CACL & SMHM (not used).	Limited to southern California least tern colonies and possible Snowy plover applications
Bal-Chatri traps	• Birds – raptors, shrikes,	Capture and removal or possible relocation	MAMU – rare SNPL – weekly CACL – rare LFCL – rare LETE – weekly SMHM – rare	A cage containing live bait surrounded by monofilament nooses. This trap is typically placed under the perch of a target bird. Effective for raptors and shrikes.
Swedish goshawk traps	• Birds – corvids & raptors	Capture and removal or possible relocation	MAMU – rare SNPL – weekly CACL – rare LFCL – rare LETE – weekly	A clam shell style cage with a separate bait compartment on the bottom. This trap is set in an open area where the lure animals in the bait cage can be seen by foraging raptors. When the raptor lands in the cage their weight causes the clam shell doors to close. Trap can be

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
			SMHM - rare	adjusted so as not to be triggered by birds under a specific size.
Pigeon harnesses	• Birds	Capture and removal or possible relocation	Rare, except LETE (infrequent).	A pigeon or starling wearing a leather harness affixed with monofilament nooses. Bait bird is anchored but has relatively free movement on the ground. Particularly effective for capturing raptors which primarily hunt birds– (*i.e.*, falcons and kestrels).
Lethal Tools/Techniques				
Shooting (ground)	• Birds • Mammals	Removal	Daily, except MAMU (weekly)	Use of hand guns, rifles, and shotguns by trained personnel to selectively remove individual predators foraging in T&E areas. Shooting is often used in conjunction with calling or spotlighting to target a specific animal or species. Suppressors are commonly used on rifles for T&E projects.
Lethal Tools/Techniques (continued)				
Rodent Traps	• Mammal (small)	Removal	MAMU – rare SNPL – weekly CACL – not used LFCL – weekly LETE – daily SMHM – not used	For T&E protection, typically used to control rats and ground squirrels around nest colonies. Use of rodent traps is very site specific depending on rodent density and historical issues. Some sites are trapped extensively during the prehatch period. Some sites use traps outside the chick fence.
			MAMU – not used	

PREDATOR CONTROL METHOD	SPECIES PREDATOR GROUP(s) TARGETED[1]	PURPOSES	FREQUENCY OF USE IN ACTION AREA[2]	TYPICAL USE, LOCATION/SETTINGS FOR T&E PROTECTION
Grid Searches	• Reptiles	Removal	SNPL – infrequent CACL – not used LFCL – rare LETE – infrequent SMHM – not used	LETE, SNPL, LFRR
Egg addling/oiling/destruction	• Birds	Removal	Infrequent, except MAMU (rare)	Selective. Used in suppressing reproduction in local predating bird populations by destroying egg embryos prior to hatching, or by asphyxiation of developing embryos prior to hatching..

1 – For a list of species within groups that are targeted by these methods, see **Table 1**.
2 – Frequency categories are defined by APHIS-WS per the following:
- Daily: 4+ days per week during T&E protection season (nesting/breeding)
- Weekly: 1+ days per week, 3 applications per month, and/or 50+ applications over 10 years
- Infrequent: 3 or fewer applications per month, and 10-50 applications over 10 years
- Rare: less than 10 applications over 10 years
- Not used: no applications over 10 years

Table A-2. Noise attenuation of distance for each proposed auditory device and expected effects to western snowy plovers, California clapper rails, light-footed clapper rails, and California least terns.

Device (maximum dBA)	Distance from source (feet); dBA reduced by average of 6.75 dBA/doubling of distance – moderate stature, non-forest vegetation, moderately "soft" environment (c):														
	3	**6**	**12**	**24**	**48**	**96**	**192**	**384**	**768**	**1536**	**3072**	**6144**	**12288**	**24576**	**49152**
Bird bangers	120	113.25	106.5	99.75	93	86.25									
Screamer	130	123.25	116.5	109.75	103	96.25	89.5	82.75							
Cracker shell	130	123.25	116.5	109.75	103	96.25	89.5	82.75							
Pistol	170	163.25	156.5	149.75	143	136.25	129.5	122.75	116	109.25	102.5	95.75	89	82.25	
Rifle	170	163.25	156.5	149.75	143	136.25	129.5	122.75	116	109.25	102.5	95.75	89	82.25	
Shotgun	165	158.25	151.5	144.75	138	131.25	124.5	117.75	111	104.25	97.5	90.75	84		
Suppressed rifle	130	123.25	116.5	109.75	103	96.25	89.5	82.75							
BB gun	100	93.25	86.5												
Net gun/launcher	170	163.25	156.5	149.75	143	136.25	129.5	122.75	116	109.25	102.5	95.75	89	82.25	

Effects notes: >80 dBA, behavior disturbance (b); > 125 dBA, permanent hearing damage/loss (a)

References: (a) Dooling and Popper 2007; (b) Transportation Noise Control Center 1997 *in* USFWS 2013; (c) Washington Department of Transportation 2015.

Table A-3. Noise attenuation of distance for each proposed auditory device and expected effects to salt marsh harvest mice.

Device (maximum dBA)	Distance from source (feet); dBA reduced by average of 6.75 dBA/doubling of distance – moderate stature, non-forest vegetation, moderately "soft" environment (c):													
	3	**6**	**12**	**24**	**48**	**96**	**192**	**384**	**768**	**1536**	**3072**	**6144**	**12288**	**24576**	**49152**
Bird bangers	120	113.25	106.5	99.75	93	86.25	79.5								
Screamer	130	123.25	116.5	109.75	103	96.25	89.5	82.75	76						
Cracker shell	130	123.25	116.5	109.75	103	96.25	89.5	82.75	76						
Pistol	170	163.25	156.5	149.75	143	136.25	129.5	122.75	116	109.25	102.5	95.75	89	82.25	75.5
Rifle	170	163.25	156.5	149.75	143	136.25	129.5	122.75	116	109.25	102.5	95.75	89	82.25	75.5
Shotgun	165	158.25	151.5	144.75	138	131.25	124.5	117.75	111	104.25	97.5	90.75	84	77.25	
Suppressed rifle	130	123.25	116.5	109.75	103	96.25	89.5	82.75	76						
BB gun	100	93.25	86.5	79.75											
Net gun/launcher	170	163.25	156.5	149.75	143	136.25	129.5	122.75	116	109.25	102.5	95.75	89	82.25	75.5

Effects notes: >74.25 dBA (background +3) 50% reduced listening area, 30% reduced alerting distance (a); >95 dBA, temporary hearing loss (b); > 120 dBA, permanent hearing damage/loss (c)

References: (a) Barber *et al* 2009; (b) NoiseQuest (website) 2017; (c) Washington Department of Transportation 2015.

Biological Assessment:
Protection of Desert Tortoises from Predation in California

Prepared by:

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LIST OF ACRONYMS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BA	Biological Assessment
BLM	Bureau of Land Management
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDPR	California Department of Pesticide Regulation
CFR	Code of Federal Regulations
CY	Calendar Year
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
IWDM	Integrated Wildlife Damage Management
MOU	Memorandum of Understanding
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WS	Wildlife Services
WS-California	Wildlife Services-California

EXECUTIVE SUMMERY

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) in California (WS-California) conducts integrated wildlife damage management (IWDM) within the range of the desert tortoise (*Gopherus agassizii*) within California. IWDM would be conducted for the protection of the desert tortoise from predators such as common ravens (*Corvus corax*) and coyotes (*Canis latrans*). Other predators may be targeted if they are found to be depredating on or are a threat to desert tortoises. In 2012 and 2014, WS-California completed informal section 7 consultations with the U.S. Fish and Wildlife Service (USFWS) to address possible effects on the desert tortoise from IWDM for the protection of livestock, property, human health and safety, and natural resources. This biological assessment (BA) updates those previous consultations.

WS-California has reviewed its program for the protection of desert tortoises, and its statewide IWDM program, and has made the following determinations. WS-California has determined that its WDM program to protect the federally threatened desert tortoise **may affect, but not likely to adversely affect** desert tortoises in California. WS-California has further determined that its IWDM activities (gas cartridges, padded foothold traps, foot and neck snares, detection and decoy dogs, site presence, ground shooting, aerial shooting, and) **may affect, but not likely to adversely affect** federally threatened desert tortoises in California. In addition, WS-California has determined that its activities will result in **No Destruction or Adverse Modification** of desert tortoise critical habitat. USFWS concurrence is requested.

INTRODUCTION

Purpose of this Biological Assessment

WS-California currently performs integrated wildlife damage management (IWDM) to remove predators for the protection of the federally listed desert tortoise (*Gopherus agassizii*) in California. This BA evaluates potential effects of this IWDM on desert tortoise and the associated critical habitat under section 7 of the federal Endangered Species Act (ESA) of 1973, as amended. WS-California is the action agency and lead federal agency for this ESA consultation. WS-California targets individual predators that are known or suspected to be depredating on desert tortoises. These and other actions to protect desert tortoise from predation occur wherever desert tortoises are found within California. During the past few decades, the increase in human subsidized food, water, shelter, nesting, and roosting sites has contributed to an increased population of common ravens in the California desert and has caused some species of mammals to congregate near humans (USFWS 2008). This has resulted in an increase in localized predation of desert tortoises.

Consultation History

- On April 15, 2014, WS-California completed the May 9, 2012 informal section 7 consultation amendment (FWS/R8/AES/08E00000-2014-1-0011) that included California condor (*Gymnogyps californianus*), desert tortoise, and adult gray wolf (*Canis lupus*).

- On May 9, 2012, WS-California submitted an amendment to the USFWS to revise and replace the September 8, 2008 amendment with new program information. This included an informal section 7 consultation on San Joaquin kit fox (*Vulpes macroti mutica*), California condor, desert tortoise, and adult gray wolf.

Authorities

Wildlife Services is authorized by Congress to protect American agriculture and other resources from damage associated with wildlife by providing assistance to agencies, organizations, and individuals in resolving wildlife conflicts. The Act of March 2, 1931, as amended (46 Stat. 1468-69, 7 U.S.C §§ 8351-8352) states: "*The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program….*". The Secretary of Agriculture has delegated this authority to Wildlife Services (WS Directive 1.210: Legal Authority). The Act was amended in 1987 (The Act of December 22, 1987 (Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 8353)) to further provide that: "*On or after December 22, 1987, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control Activities.*"

PROJECT DESCRIPTION

Project Justification

In 2008, the USFWS published a *Final Environmental Assessment (EA) to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise* for which WS-California was one of the cooperating agencies. Additionally, in the Desert Tortoise (Mojave population) Recovery Plan, the USFWS identifies reducing predation on the desert tortoise as a recovery task (USFWS 2011). At the request of land and resource managers, WS-California implements IWDM activities to alleviate damage from avian and mammalian predators to desert tortoises on a local level. This BA addresses control methods that include the targeted removal of known desert tortoise predators by shooting or trapping (live or lethal), as well as nest removal, directed at specific problem areas within the range of the desert tortoise in California.

Project Location

WS-California actions take place on federal, state, and private land in the California desert within the range of the desert tortoise. In the past, WS-California has removed predators for the protection of desert tortoises on land managed by the National Park Service, the Bureau of Land Management (BLM), and the Department of Defense. The program has grown to encompass all of the Mojave and Colorado Deserts.

Most of the work is performed in San Bernardino county. However, some of the work also occurs in Los Angeles, Riverside, and Kern counties. Locations for predator damage management are identified by the cooperator. Raven nests within tortoise habitat are identified, then surveys are conducted beneath the nest to locate juvenile desert tortoise shells. If tortoise shells are found underneath the nest or in the surrounding area, that location is reported to WS-California for the removal of those individual predators.

Coyote management is usually conducted in areas where desert tortoises are relocated into a holding area from an area that has been cleared of all desert tortoises to allow for development or other human use of the land (e.g., expansion of military training lands or renewable energy infrastructure).

WS-California has recently been contracted by USFWS to conduct large scale raven management along the Interstate 10 corridor to reduce the total population of ravens in that broad area. Raven removal activities will be conducted in areas where ravens congregate in the fall and winter months.

WS-California Overview

Wildlife Services is authorized and directed to resolve conflicts involving damage associated with wildlife, including animals preying on or harassing livestock and wildlife, damaging property, or threatening human health and safety. WS-California is a collection of cooperative programs with other federal, state, and local agencies, private individuals, and associations to protect livestock, poultry, natural resources (e.g., wildlife), property, and human health and safety from wildlife threats and damages. WS-California conducts technical assistance (education, information, and advice), and operational assistance (preventative and corrective) to achieve these goals. Operational assistance on public and private lands is conducted under memoranda of understanding (MOUs), cooperative agreements, or agreements for control. All wildlife damage management is based on interagency relationships, which require close coordination and cooperation due to overlapping authorities and legal mandates.

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. IWDM is the implementation of safe and practical methods for the prevention and control of damage caused by wildlife based on the analysis and informed judgment of trained personnel. The philosophy behind IWDM is to implement effective management techniques in a cost-effective manor while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. It may incorporate cultural practices (e.g., animal husbandry), habitat modification, altering animal behavior (e.g., harassment), removal of specific problem animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problems. Consideration is given to the following factors before selecting or recommending control methods and techniques:

- species responsible for damage;
- magnitude, geographic extent, frequency, and duration of the problem;

- status of target and non-target species, including threatened and endangered species;
- local environmental conditions;
- potential biological, physical, economic, and social impacts;
- potential legal restrictions;
- costs of control options; and
- what other strategies can be implemented if prevention efforts (non-lethal and lethal techniques) fail to stop damage.

When WS-California receives a request for assistance, trained and experienced employees determine the appropriate IWDM methods to recommend and/or implement by using the APHIS-WS Decision Model (Slate et al. 1992; hereafter called the "Decision Model"; Figure 1). Upon receiving a request for assistance, an employee uses the Decision Model to assess the problem and evaluate the effectiveness of the various methods available for IWDM. The employee then recommends a strategy based on a variety of factors including short-term and long-term effectiveness of the methods; possible restrictions due to laws, regulations, or site-specific conditions; environmental considerations; and cost. The employee presents the options and methods deemed to be practical and effective for the situation to the cooperator. Non-lethal and preventative measures are given priority when appropriate and practicable. After management methods have been applied, the employee and/or the requestor monitor the effectiveness of the employed methods. Based on the employee's evaluation of the monitoring results, management strategies are adjusted, modified, or discontinued, as needed.

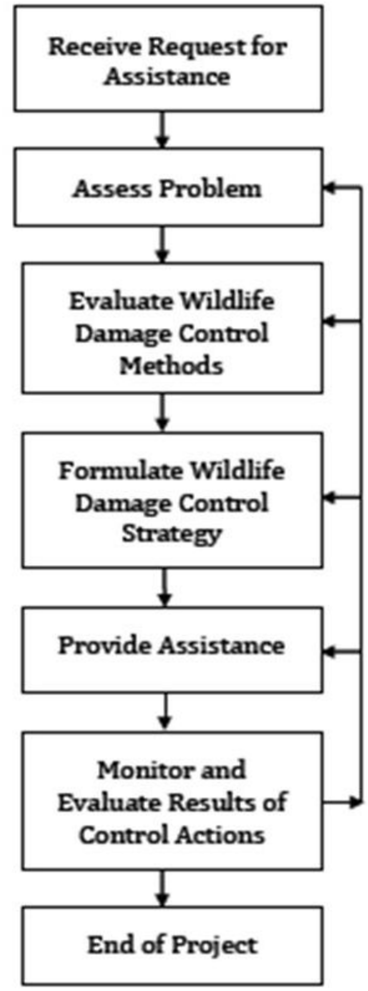

Figure 1. APHIS-WS Decision Model (Slate et al. 1992)

WS-California conducts direct control activities on lands where signed Work Initiation Documents for wildlife damage management (formally called Agreements for Control on private/non-private Property; hereafter called Agreements) have been executed. These Agreements list the intended target animals and methods to be used. In some cases, with public land agencies, an MOU serves as these Agreement for damage management activities.

WS-California discusses with the requestor which methods will be requestor-implemented and which, if any, will be provided by WS-California. Because WS-California receives limited

Congressional funding, requestors are asked and expected to implement methods on their own when reasonable, thereby reducing the need for WS-California's continued assistance. This allows WS-California efforts to be focused on those activities that the requestor is less skilled or equipped to do, such as many lethal control actions. Responses by WS-California personnel to requests are documented in WS' Management Information System. Consideration is given to a variety of factors including the presence of and potential risk to non-target species including threatened and endangered species.

Types of Management Assistance

Technical Assistance

These recommendations are the responsibility of the requestor to implement. WS-California personnel provide information, demonstrations, and advice on many of the available IWDM techniques. Technical assistance includes demonstrations on the proper use of management devices (propane exploders, turbo fladry, cage traps, etc.) and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Technical assistance is generally provided by WS-California personnel following an on-site visit or a verbal consultation with the requestor for short and long-term solutions to damage problems. These strategies are based on the level of risk, the abilities of the requestor, need, and practical application. Technical assistance may require substantial effort by WS-California personnel in the decision-making process, but the actual management is primarily the responsibility of the requestor.

Operational Assistance

These activities are conducted or supervised by WS-California personnel. Operational assistance is implemented when the problem cannot effectively be resolved through technical assistance and when Agreements provide for WS-California operational assistance. An initial investigation defines the nature and history of the problem, extent of the damage, and the species responsible for the damage. Professional skills of WS-California personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or if the problem is too complex and requires the direct supervision of a wildlife professional. WS-California considers the biology and behavior of the damaging species and other factors using the WS Decision Model (Slate et al. 1992). The recommended strategies may include any combination of proactive and reactive actions that could be implemented by the requestor, WS-California, or other agencies, as appropriate. Reactive management, that which is applied in response to a loss with the intent of abating or reducing further losses, is most often used. Proactive management, the application of damage management strategies prior to damage occurring, is applied less frequently, usually in areas with historical or chronic damage.

INTEGRATED WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

Damage management actions for this project target wildlife species depredating on desert tortoises (Table 1). This management is often conducted in proximity to desert tortoises. Some of the methods used in this management are lethal; however, WS-California will use mitigating measures discussed in this document to reduce the likelihood of them affecting desert tortoises.

Table 1. Species that WS-California typically targets for the protection of the desert tortoise.

Common Name	**Scientific Name**
Mammal Species	
American badger	*Taxidea taxus*
Bobcat	*Lynx rufus*
Coyote	*Canis latrans*
Feral/Free-ranging Dog	*Canis familiaris*
Raccoon	*Procyon lotor*
Red fox	*Vulpes vulpes*
Striped Skunk	*Mephitis mephitis*
Bird Species	
Red-tailed Hawk	*Buteo jamaicensis*
Common Raven	*Corvus corax*

From calendar year (CY) 2015 through 2020, WS-California lethally removed 570 target animals—most of which were common ravens—and removed/destroyed 4 common raven eggs. A breakdown of the species removed, by method used, can be found in Table 2. Padded foot-hold traps and cage traps are non-lethal capture methods. Target animals captured using these methods were subsequently euthanized as described in this document.

Table 2. Target species taken for desert tortoise protection from CY 2015-2020.			
Target Species	**Method**	**Lethally Removed**	**Removed/Destroyed**
American Badger	Firearms	1	
Common Raven	Firearms	550	
	Egg Removal		4
Coyote	Firearms	1	
	Padded Foot-hold Trap	17	
Striped Skunk	Cage Trap	1	

During the same period WS-California captured and released five non-target animals, as shown in Table 3. The desert kit fox was captured in 2017 because the pan tension device on the padded foot-hold trap was not set to the correct weight. This error was remedied and has not occurred since. All non-target animals were immediately released on-site and unharmed.

Table 3. Non-target species captured and released during desert tortoise protection activities from CY 2015-2020.		
Target Species	**Method**	**Freed/Released**
American Badger	Padded Foot-hold Trap	1
Bobcat	Padded Foot-hold Trap	2
Desert Kit Fox	Padded Foot-hold Trap	1

Technical Assistance

A wide range of non-lethal management tools are recommended by WS-California for IWDM but are implemented by the landowner/manager. Compliance with applicable federal, state, and local laws and regulations is the responsibility of the landowner/resource owner implementing them. These methods are not included in this consultation because they are not implemented by WS-California personnel.

Non-lethal Methods

Non-lethal methods are the primary preventative practices used by resource owners. WS-California frequently recommends these through technical assistance, and they may be used operationally by WS-California in limited cases. These methods are recommended based on the level of risk, need, and WS-California's professional judgment on their effectiveness and practicality. This section lists the non-lethal methods commonly used for this project.

Inactive Nest Destruction

Inactive nest destruction is the removal of nesting materials during the construction phase of the nesting cycle (i.e., there are no eggs or young in the nest) or outside of the breeding season (i.e., also no eggs or young in the nest). The removal of nests is intended to deter birds from nesting in the same area again. Birds generally attempt to re-nest, so the method may need to be conducted repeatedly throughout the nesting season and over several years. The Migratory Bird Treaty Act does not contain any prohibition against the destruction of a migratory bird nest alone (without birds or eggs), except in the case of threatened or endangered species or bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles, provided that no possession occurs during the destruction (USFWS 2003). Once eggs are present in the nest, nest destruction is classified as lethal take and requires a permit. Inactive nest removal is typically performed by utility companies and not by WS-California. However, WS-California may use this method in the future to remove common raven nests from rock outcroppings, powerlines, and other nesting areas.

Physical Exclusion

Physical exclusion is the use of barriers such as fencing, grid wires, wire mesh and netting to prevent the damaging species from accessing protected animals or sensitive areas. Predator exclosures are used by cooperators on this project to protect desert tortoises. While they can be effective, they can be labor intensive and cost prohibitive especially for large areas.

Scarecrows and Effigies

Scarecrows and effigies are used to depict predator animals (e.g., coyotes, owls), people, or mimic distressed target species (e.g., dead crows, dead vultures) and they are intended to elicit a flight response from target birds and discourage mammals from entering an area. Several studies found effigies to be an effective method of dispersing vultures and crows (Avery et al. 2002, Avery et al. 2008, Seamans 2004). In general, scarecrows/effigies are most effective when they are moved frequently, alternated with other methods, and are well maintained.

Lethal Methods

Non-lethal and preventative measures are given priority when appropriate and practicable; however, there are limits to their effectiveness in some cases. The methods listed in this section are methods typically used by WS-California to resolve wildlife damage management issues after non-lethal measures have been deemed ineffective.

Active Nest Destruction

Active nest destruction is the destruction of nests with eggs or young. It is a dispersal technique used to encourage adult birds to leave the area. In addition to dispersing birds, this method may also reduce the aggressive nature of adult birds during the nesting period. For birds protected under the MBTA, the USFWS permits "active nest destruction" only under the issuance of a depredation permit. This control method is target-specific, with very little chance for the take of non-target species.

Egg Addling/Shaking

Egg addling/shaking is a method of suppressing reproduction in local bird populations using shaking or other mechanical methods to destroy the embryo within the egg. Treated eggs are returned to the nest and the adult birds remain attached to the nest site. This method is used to reduce recruitment rather than to serve as a dispersal method as the incubating birds generally continue incubation and do not re-nest. This control method is target-specific, with very little chance for the take of non-target species.

Egg Oiling

Egg oiling is a method similar to egg addling/shaking for suppressing reproduction of birds. A small quantity of food grade vegetable oil or corn oil is sprayed on eggs in nests. The oil prevents the exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability (Pochop et al. 1998). The Environmental Protection Agency (EPA) ruled that the use of corn oil for this purpose is exempt from registration requirements under the Federal Insecticide, Fungicide, and Rodenticide Act. WS-California will follow all guidelines in the Tech Note Wildlife Services Egg Oil: An Avian Population Control Tool (2001) and USFWS depredation permits. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in the nest and at least five days before anticipated hatching. This method is extremely target specific and is less labor intensive than egg addling.

DRC-1339

DRC-1339 is an avian toxicant that is used to target common ravens. WS-California has used DRC-1339 to protect desert tortoises in the early 1990's but has not used it since protections began under the 2008 USFWS EA to protect juvenile desert tortoises. This is a method that may be used when resource owners determine that the common raven population needs to be drastically reduced in certain management areas. Baits treated with DRC-1339 would be placed above ground—typically on elevated platforms—where ground or climbing animals would not have access to the treated bait. The EPA label for DRC-1339 requires its use on meat baits or injected into chicken, turkey, or duck eggs. The selection of chicken eggs as bait would minimize herbivores and other carnivorous species of birds from being attracted to and consuming the bait. Pre-baiting the platforms with hard boiled chicken eggs would be conducted and monitored closely with the use of game cameras prior to placing any eggs treated with DRC-1339 into them to help prevent non-target consumption of treated eggs. If non-target species are observed feeding on the untreated eggs in some locations, treated eggs would not be placed in those locations. The eggs would be "tied down" so that common ravens must eat them at the bait site and cannot cache the baits where they might be found and consumed by other non-target animal species.

New technology may allow personnel to specifically target common ravens that are known to prey on desert tortoises. The use of 3D printed tortoise shells would allow DRC-1339 to be placed inside the shell. The 3D printed shells are roughly to same thickness as a real tortoise shell, so they will break just like a real one when a raven target it. Since DRC-1339 can be applied to meat baits then inserted into the 3D printed juvenile desert tortoise shells, this technology could be used to remove offending ravens. Placing the treated 3D printed juvenile desert tortoise shells on an elevated platform would prevent non-target species from feeding on the treated meat baits.

Gas Cartridges

Gas cartridges are used in the technique of denning. Denning is the practice of locating coyote, red fox, and striped skunk dens and taking the young and/or adults by using a registered gas fumigant cartridge. This method is used to manage current depredations of livestock by coyotes, red fox, and striped skunks, or anticipated depredation from coyotes. When the adults are killed and the den site is known, denning is used to euthanize the pups and prevent their starvation. Denning is highly selective for the target species responsible for damage. Denning for coyotes and red foxes is often combined with other damage management activities such as aerial shooting and ground shooting.

Gas cartridges are normally applied in rural settings on both private and public lands. When dens are selected for fumigation, the fuse of the gas cartridge is ignited and hand-placed at least three to four feet inside the active den. Soil is then placed in the den entrance to form a seal to prevent the carbon monoxide from escaping and oxygen from entering. Sodium nitrate is the principle active chemical in gas cartridges and is a naturally occurring substance. When ignited, the cartridge burns in the den, depleting the oxygen and producing large amounts of carbon monoxide, a colorless, odorless, tasteless, poisonous gas.

The use of gas cartridges may pose a risk to non-target animals that may also be found in burrows of target predators. Given the omnivorous nature of target predators, non-target rodents, reptiles, or amphibians are highly unlikely to occur in a coyote or fox den.

All animals removed by denning are humanely euthanized per WS Directives 2.425 and 2.505 (USDA 2021). The gas cartridges used for denning (EPA Reg. No. 56228-21-ZA) are registered by WS with California Department of Pesticide Regulation (CDPR). All pesticides used by WS-California are registered under FIFRA and administered by the EPA and CDPR. All WS-California personnel who apply registered-use pesticides are state-certified pesticide applicators and have specific training by WS-California for pesticide application per Wildlife Services Directive 2.465 (USDA 2021).

Quick kill/Body Gripping Traps

Quick-kill traps are commonly used by WS-California to capture various mammals and rodents. Quick-kill traps come in a variety of styles, including body-gripping, snap (rat or mouse variety), and gopher and mole traps. The body-gripping trap is lightweight, easily set, and consists of a pair of rectangular wire frames that close when triggered, killing the captured animal with a quick body blow. The most commonly used trap is the Conibear® which is set in waterways to lethally take beaver. When applied for this use, the traps are set underwater in the entrances of beaver lodges, in underwater travel corridors, or near areas at or near a beaver dam or other beaver activity. Body-gripping traps set to capture muskrat are used mostly in shallow water den entrances or underwater travel corridors. Conibear® sets for nutria, river otter or mink may be set similar to beaver and muskrats. Smaller body-gripping traps (jaw spread less than 6 inches) can be used on land in trees and buildings for a variety of animals (e.g., ground squirrels). Wildlife Services policy prohibits the use of body-gripping traps with a jaw spread exceeding 8 inches for land sets (APHIS-WS Directive 2.450; USDA 2021). Smaller-sized traps may also be set in the entrance of a wooden box or other structure having food or bait placed inside so the animal will trigger the trap when attempting to access the bait. Quick-kill traps set for beaver, nutria, mink, and muskrat may be used in both urban and rural areas and set types generally preclude non-target animals from capture. Quick-kill traps are lethal to both target and non-target animals.

Per the California Code of Regulations (CCR), Fish and Game Code §4004€ it is unlawful to "use a conibear trap that is 6 inches by 6 inches, unless partially or wholly submerged in water. Unless prohibited by the department [California Department of Fish and Wildlife (CDFW)] as a permit condition, a lawfully set conibear trap that is 10 inches by 10 inches or less may be set pursuant to [14 CCR §465.5(g)]."

Per 14 CCR §465.5(g) Conibears® "…with a jaw larger than 8 inches by 8 inches may be used only in sets where the trap is wholly or partially submerged in water or is: A) within 100 feet of permanent water, B) within 100 feet of seasonally flooded marshes, pastures, agricultural lands, or floodways when standing or running water is present, and C) within the riparian vegetation zone, characterized by, but not limited to, willow, cottonwood, sycamore, salt cedar, cattail, bulrush and rushes, when found within the area defined in section 463(a) where the take of beaver is permitted."

Aerial Shooting

Aerial shooting, with both fixed-wing and rotary-wing (helicopters), is used by WS-California to remove coyotes. The most frequent aircraft used for aerial shooting and hazing are the fixed-wing aircraft Piper PA-18 Super Cub and Cub Crafters CC-18 Top Cub, and rotary-wing Hughes MD500. WS-California conducts aerial activities only on areas with signed Agreements or federal Annual Work Plans and concentrates efforts to specific areas during certain times of the year. During technical assistance, WS-California may advise cooperators to hire private operators with CDFW permits for aerial shooting of coyotes. Additionally, WS-California may conduct the work operationally at the request of cooperators.

Aerial shooting consists of visually sighting target animals in the problem area and shooting them with a firearm from an aircraft. Aerial shooting is species-specific and can be used for immediate damage relief, providing that weather, topography and ground cover conditions are favorable. Aerial shooting can be effective in removing offending animals that have become trap-shy or are not susceptible to calling and shooting or other methods.

Fixed-wing aircraft are useful for aerial shooting over flat and gently rolling terrain. Because of their maneuverability, helicopters have greater utility and are safer over timbered areas or broken land where animals are more difficult to spot. Aerial shooting typically occurs in remote areas with low densities of tree or vegetation cover, where the aerial visibility of target animals is greatest. WS-California spends relatively little time flying and shooting over any one area.

Wildlife Services Directive 2.620 and the WS aircraft-use policy help ensure that aerial shooting is conducted in a safe and environmentally sound manner, in accordance with federal and state laws (USDA 2021). State Directors and District Supervisors are responsible for supervision, management, and compliance for all aviation activities within California. All aircraft used in WS-California activities through contract, agreement, or volunteer shall have been approved by the office of the WS National Aviation Coordinator. Wildlife Services Directive 2.615 guides all WS shooting activities (USDA 2021). All efforts are conducted in strict compliance with the WS Aviation and Safety Manual, Federal Aviation Regulations, the Fish and Wildlife Act of

1956 (Airborne Hunting Act), any applicable state and local laws and regulations, WS-California Aviation Safety Plan, Aviation Communication Plans, and Aviation Emergency Response Plans.

WS has an Aviation Training and Operations Center located in Cedar City, Utah. Its mission is to improve aerial operations safety and provide training and guidance for WS aviation personnel and aerial activities. The policy and primary focus of WS-California and contract aviation personnel is ensuring their well-being through safety and accident prevention efforts. Pilots and aircraft must be certified under established WS-California procedures. Only properly trained WS-California employees are approved crewmembers. Ground crews are often used with aerial operations for safety and for providing assistance with locating and recovering target animals.

Ground Shooting

Ground shooting is sometimes used as one of the first lethal damage management options because it offers the potential of resolving a problem quickly and selectively. WS-California personnel may either provide advice regarding ground shooting for predators as part of technical assistance or provide the service themselves. WS-California employees undergo training to properly identify ravens, crows, and raptor species in low ambient light conditions. Shooting is limited to locations where it is legal and safe to discharge a weapon.

Tools such as spotlights, night vision devices, thermal imagery for night shooting, predator calling, stalking, the use of dogs, and/or baiting may be used to increase ground shooting efficiency and selectiveness. Spotlights are often covered with a red lens which nocturnal animals may not be able to see, making it easier to locate them. Night shooting may be conducted in sensitive areas that have high public use, or other activity, during the day which would make daytime shooting unsafe. The use of night vision and Forward Looking Infrared devices can also be used to detect and shoot predators at night. Calling devices are sometimes used to draw specific species to an area where they can be lethally removed with a firearm. Electronic devices broadcast recorded, or artificial wildlife sounds in the immediate area often in short bursts. Coyotes that may be trap-wise, and therefore difficult to trap, are often responsive to simulated predator calling. Similarly, decoy dogs are sometimes used to lure coyotes within shooting distance. These dogs are kept under control of personnel and are unlikely to interact with wildlife.

To ensure safe use and awareness, WS-California employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within three months of their appointment and a refresher course annually thereafter (WS Directive 2.615; USDA 2021). The use and possession of firearms must be in accordance with federal, state, and local laws and regulations (WS Directive 2.210; USDA 2021). WS-California personnel must adhere to all safety standards of firearm operation as described in the WS Firearms Safety Training Manual. Such personnel are subject to drug testing when considered for hire, randomly, when under reasonable suspicion, and after accidents have occurred. All employees who use firearms are subject to the Lautenberg Domestic Confiscation Law, which prohibits firearm possession by anyone convicted of a misdemeanor crime of domestic violence. WS-California complies with all applicable state laws and statutes during ground shooting.

While on duty, WS-California employees are authorized to store, transport, carry, and use only the firearms necessary to perform official WS-California duties. The maximum type of security available must be used to secure firearms when not directly in use and to ensure that unauthorized access is prevented. No firearms shall be left unattended unless securely stored. Authorization is required for leaving firearms stored in vehicles overnight (within locked safes). Ammunition, pyrotechnic pistols, net guns, dart guns, air rifles, and arrow guns will be stored securely unloaded as determined by the State Director.

CDFW, commercial operators, and landowners/resource owners can also use ground shooting for IWDM, in compliance with state laws and regulations.

Restraint Methods

The methods discussed below are typically used to non-lethally capture and hold an animal alive until personnel arrive. The animal can then be euthanized or released as appropriate. Some of the methods can also be set to kill the animal. Restrained target animals are most often euthanized. Target animals are rarely relocated. Translocation of wild animals is discouraged by WS policy (WS Directive 2.501; USDA 2021) because of the stress to the relocated animal, poor survival rates due to strife with established conspecifics, and because of difficulties in adapting to new locations and habitats. Relocation of captured problem animals is also opposed by the American Veterinary Medical Association (AVMA), the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists because of the risk of disease transmission among wild mammals. In addition, it is against California state law to relocate wild mammals (14 CCR § 465.5(g) (1)). In those rare instances that WS-California relocates an animal, it will be at the request of CDFW or USFWS.

Detection dogs are sometimes used to identify sites where equipment may be effective by indicating where mountain lions (*Puma concolor*), bears, coyotes, or other predators have travelled, urinated, or defecated. Detection dogs are kept under the control of WS-California personnel, and are unlikely to directly interact with wildlife.

<u>Cable Restraints</u>

Cable restraints can be used for live-capture and release, for holding for subsequent euthanasia, or for a direct kill, depending on how and where they are set. They are made of strong, lightweight cable, with a locking device, and are used to capture animals by the neck, foot, or body. Cable restraints, also called snares, are often set on animal travel corridors, such as under fences or on trails through vegetation.

When an animal steps into a snare placed horizontally on the ground, a spring is triggered, and the cable tightens around the foot to hold the animal. If the snare is placed vertically, the animal walks into the snare and the neck or leg is captured. On standard cable snares, cable locks are typically used to prevent the loop from opening again once the loop has closed around an animal. Loop stops can also be incorporated to prevent the loop from either opening or closing beyond a minimum or maximum loop circumference, which can effectively exclude non-target animals and allow for the live capture of target animals.

Most snares are also equipped with a swivel to minimize injuries to the captured animal and reduce twisting and breakage of the snare cable. Breakaway devices can also be incorporated into snares, allowing the loop to break open and release the animal when a specific amount of force is applied. These devices can improve the selectivity of cable restraints to reduce non-target species capture for non-target species which can exert a greater force to break the loop than the target species.

The Collarum™ is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes and foxes. It is activated when an animal bites and pulls a cap with a lure attractive to canids, whereby the snare is projected from the ground up and over the head of the coyote or fox. As with other types of snares, the use of the Collarum™ device to capture coyotes is greatly dependent upon finding a location where coyotes frequently travel. A cable stop on the device limits loop closure, which allows smaller non-targets to escape and prevents lethal capture so that similar sized non-targets can be released. The trigger is designed specifically for canines and uses a distinct pulling motion to set off the device which further limits non-target capture.

In general, cable restraints are available to all entities to alleviate damage within state law. They offer several advantages over padded foothold traps by being lighter to transport or carry and not being as affected by inclement weather.

Cage Traps

Cage traps vary in size and shape depending on the species being targeted. Large cage traps are occasionally used by WS-California for the capture of coyotes, red foxes, feral dogs, feral swine, and mountain lions. WS-California defines large cage traps as being larger than 12"x12"x36", excluding culvert traps. Bobcat or coyote-size cage traps are made of welded wire, utilize a treadle type trigger system and close with a spring or gravity door. Large cage traps for more powerful animals are typically constructed of commercial livestock panels made of 3/16" galvanized welded rods. The top, sides, front, and bottom panels are welded together, and panel mesh size is approximately 2"x4". These cage traps may have a treadle type trigger and a single-catch, multi-catch, or gravity door. They can easily be transported by vehicle.

Cage traps are typically set with a bait or lure to encourage the target species to enter the trap. Baits can be chosen to be selective for target species. A trigger mechanism usually located at the back of the trap is triggered by the animal and the trap closes. The animal is enclosed in the trap and held until it is subsequently released or euthanized. Because the animal is held alive, if a non-target animal is captured, it can usually be released unharmed.

Selecting an appropriately sized cage trap for a specific damaging animal can limit non-target captures by physically excluding them from the trap. Traps are set near signs of damage or near known travel areas, which further limits non-target capture. Cage traps set by WS-California are checked daily by WS-California personnel, the landowner/manager, or their designated agent.

WS-California most commonly uses cage traps near homes and outbuildings in urban/suburban areas, but they may also be used in rural locations. Non-target animals are generally released with little or no injury. Target animals are euthanized, released on-site (e.g., disease surveillance or population monitoring), or relocated when appropriate and as requested and approved by the CDFW or USFWS.

Padded Foot-hold Traps

Padded foot-hold traps can be used in California for the protection of public safety and protection of threatened and endangered species (in Nat. Audubon Society v. Davis (N.D. Cal. 2000) 144 F. Supp. 2d 1160, the United States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of this method for the protection of threatened and endangered species.)

Padded foot-hold traps are used for live-capture and release or hold for subsequent euthanasia. They are made of steel with springs that close the jaws of the trap around the foot of the target species. The jaws are covered with rubber padding designed to minimize injury. Padded foot-hold traps are equipped with a pan tension device that is set to trigger the trap based on the weight of the targeted species and exclude smaller non-target species. Padded foothold traps may also have offset jaws, which further reduce the risk of injury. These traps usually permit the release of non-target animals unharmed.

Traps are placed in the travel paths of target animals and some are baited or scented, using an olfactory attractant, such as the species' preferred food, urine, or musk/gland oils. The use of baits also facilitates the prompt capture of target predators by increasing the chances that the target animal will be attracted to the trap. In some situations, a draw station (i.e., a carcass, or large piece of meat) is used to attract target animals. In this approach, one or more traps are placed in the vicinity of the draw station. Wildlife Service Directive 2.450 prohibits the placement of traps closer than 30 feet to the draw station to reduce the risk to non-target animals (USDA 2021).

The traps can be staked to the ground securely, attached to a solid structure (such as a tree trunk or heavy fence post), or used with a drag that becomes entangled in brush to prevent trapped animals from escaping. Anchoring systems should provide enough resistance such that a larger animal that is unintentionally captured should be able to either pull free from the trap or be held to prevent escaping with the trap on its foot.

Effective trap placement also contributes to trap selectivity. To minimize risk of capturing non-target animals, the user must be experienced and consider the target species' behavior and habitat, as well as the behavior and habitat of non-target animals. The pan tension, type of set, and attractant used greatly influence capture efficiency and risk of non-target capture. The level of trap success is often determined by the training, skill, and experience of the user to adapt the trap's use for specific conditions and species. When determining how often to check traps, the user must balance the need for avoiding unnecessary disturbance of the trap area with humaneness to captured animals. CCR Title 14 §465.5 (g) (2) requires that "…all traps shall be visited at least once daily by the owner of the traps or his/her designee. Each time traps are checked all trapped animals shall be removed." WS-California personnel follow this and all other state laws and regulations regarding the setting and checking of traps and snares per WS Directives 2.450 and 2.210 (USDA 2021).

Bow Nets/E-Z Catch Nets

Bow nets are spring-loaded devices used primarily in the capture of birds. They are composed of a large hoop that is loosely covered with a net and is operated either manually by pulling a string or with a remote triggering device. The bow net is baited with a food item or a visual attractant to the species of bird being targeted. When the bird is in the center of the hoop, the trigger is activated, and the spring-loaded hoop throws the net over the bird, holding it in place. E-Z catch nets are similar to bow nets, except that they have a treadle/trigger that is set off by the animal. These traps are regularly monitored so the target bird can be euthanized or relocated, or non-target captures can be immediately released.

Euthanasia Methods

Once captured, target animals are typically euthanized using a method acceptable to the AVMA. This section describes the methods used for this project.

Cervical Dislocation

Cervical dislocation is used to euthanize common ravens that are captured in live traps. The neck of the bird is hyper-extended and dorsally twisted to separate the first cervical vertebrae from the skull. The AVMA considers this technique to be a conditionally acceptable method of euthanasia and states that cervical dislocation, when properly executed, may be a humane technique for euthanasia of poultry and other small birds (AVMA 2020). Proper cervical dislocation induces rapid unconsciousness, does not chemically contaminate tissue, and is rapidly accomplished (Beaver et al. 2001).

Firearms

Firearms are often used in conjunction with a live-capture method. Once the animal has been captured using a non-lethal method, or otherwise restrained, they are euthanized by gunshot. Firearms are considered a conditionally acceptable form of euthanasia for birds and mammals (AVMA 2020). Additionally, a properly placed gunshot can cause immediate insensibility and a humane death (AVMA 2020). WS-California personnel kill animals as quickly and humanely as possible. Under some conditions a gunshot may be the only practical method of euthanasia (AVMA 2020).

Carbon Dioxide

Carbon dioxide (CO_2) is sometimes used to euthanize mammals that are captured in live traps. The live animal is placed in a container such as a plastic bucket or chamber and sealed shut. Carbon dioxide gas is released into the bucket or chamber and the animal quickly dies after inhaling the gas. This is an acceptable method of euthanasia by the AVMA (AVMA 2020).

Site Access/Increased Presence

Before WS-California conducts any wildlife damage management, a request must first be received, and an Agreement for wildlife damage management must be signed by the landowner/administrator for private lands or other comparable documents for public or tribal lands must be in place. WS-California uses 4-wheel drive vehicles, all-terrain vehicles (ATVs), and aircraft for conveyance when conducting IWDM activities. When operating on federally or state-owned lands, all WS-California compliance terms and conditions are set forth in WS-California MOUs and Annual Work Plans with land management agencies.

PROTECTED SPECIES INFORMATION

Desert Tortoise

The Mojave population of the desert tortoise was emergency listed as endangered under the ESA in 1989 (54 FR 32326), and in 1990 it was listed as threatened (55 FR 12178). The Mojave population includes all desert tortoises north and west of the Colorado River in California, southern Nevada, southwestern Utah, and northwestern Arizona. The Mojave population may be further divided into two subpopulations, western and eastern (55 FR 12178); however, these individual subunits do not qualify as distinct population segments (DPSs) under the 1996 DPS policy (USFWS 2010). A low sink that generally runs from Death Valley to the south may be used to separate the western and eastern subpopulations. The western Mojave subpopulation includes tortoises occurring within the western Mojave Desert, west of this sink. The eastern Mojave subpopulation includes tortoises in eastern California (Mojave and Colorado Deserts), southern Nevada, northwestern Arizona, and Utah (55 FR 12178).

The desert tortoise is a long-lived species with a relatively slow rate of reproduction; it does not reach sexual maturity until 10 to 15 years of age (55 FR 12178). Desert tortoises' mate during the spring and fall (USFWS 2010). Mojave Desert tortoises lay up to three clutches of eggs per year and begin reproducing at smaller sizes than Sonoran Desert tortoises (USFWS 2010). Desert tortoises spend much of their lives in burrows, even during their seasons of activity. In late winter or early spring, they emerge from overwintering burrows and typically remain active through fall (USFWS 2010). Activity decreases in the summer, but desert tortoises often emerge after summer rainstorms to drink (USFWS 2010). The size of desert tortoise home range varies by location and year (USFWS 2010). Females have long-term home ranges that may be as little or less than half that of the average male, which can range to 80 or more hectares (200 acres) (USFWS 2010). Over its lifetime, each desert tortoise may use more than 3.9 square kilometers (1.5 square miles) of habitat and may make periodic forays of more than 11 kilometers (7 miles) at a time (USFWS 2010).

Desert tortoises occupy a variety of habitats from flats and slopes typically characterized by creosote bush scrub at lower elevations to rocky slopes in black brush scrub and juniper woodland ecotones (transition zone) at higher elevations (USFWS 2010). Throughout most of the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous (non-woody) plants (USFWS 2010). Soils must be friable enough for digging burrows, but firm enough so that burrows do not collapse (USFWS 2010). During the winter, tortoises will opportunistically use existing burrows, deep caves, rock and caliche crevices, or overhangs for cover (USFWS 2010). Typical habitat for the Mojave desert tortoise has been characterized as creosote bush scrub below 1,677 meters (5,500 feet) in which precipitation ranges from 5 to 20 centimeters (2 to 8 inches) annually, where a diversity of perennial plants is relatively high, and production of ephemerals is high (USFWS 2010).

Reasons for listing include risks from construction projects such as roads, housing developments, and energy developments. The conversion of native habitats to agriculture fields has also destroyed tortoise habitat in the Mojave population (55 FR 12178). Grazing and off-road-vehicle use have degraded additional habitat (55 FR 12178). The continued existence of the Mojave population is also threatened by illegal collection, upper respiratory disease, excessive predation of juvenile tortoises by common ravens, and other factors (55 FR 12178).

The 1994 Recovery Plan and the 2011 Revised Recovery Plan included predation as one of the important factors in the decline of the Mojave Desert tortoise population. Predators of desert tortoises include, but are not limited to, coyotes, kit foxes, feral dogs, bobcats, striped skunks, American badgers, common ravens, red-tailed hawks, and golden eagles (USFWS 2011). The dominant predator varies temporally, spatially, and with the size and age of the tortoise.

For more than three decades, researchers have documented population declines throughout much of the range of the desert tortoise in California with some populations showing dramatic declines (USFWS 1994, Tracy et al. 2004). In 1990, the USFWS published a final rule listing the Mojave population of desert tortoise as threatened under the ESA (55 Federal Register (FR) 12178). The Mojave population of desert tortoise was listed as threatened under the California Endangered Species Act in 1989. The decline of the Mojave population of the desert tortoise is attributed to direct and indirect human-caused mortality including destruction, degradation, and fragmentation of habitat, and loss of individual desert tortoises from human contact, predation, and disease (USFWS 2008). Since the 1994 USFWS Recovery Plan was drafted, no significant changes in the distribution of the species have been documented despite a decline in local populations (USFWS 2010).

During the first five to seven years of life, the tortoise's shell is incompletely ossified making it easy to puncture and open (USFWS 2008). As a result, common ravens often prey on hatchling and juvenile desert tortoises. Several researchers and field biologists have reported numerous carcasses of hatchling and juvenile desert tortoises beneath common raven nest and perch sites. Campbell (1983) found 136 juvenile desert tortoise carcasses with evidence of common raven predation at the base of fence posts on the perimeter of the Desert Tortoise Natural Area. Berry et al. (1986) reported that 29 and 44 percent, respectively, of desert tortoise mortality at two study plots during a six-year period were probably caused by common raven predation. Common ravens have been observed attacking and eating juvenile desert tortoises (Berry 1985, Boarman 1993). Common ravens eat hatchling and juvenile desert tortoises by pulling off the head and limbs (40 percent) or pecking holes through the soft carapace (upper half of the shell) (46 percent) or plastron (13 percent) (Boarman and Heinrich 1999; n = 341).

Common raven populations have increased in the Western United States, including the California desert, over the past several decades. From 1969 to 2004 the number of common ravens in the western Mojave Desert increased approximately 700 percent (Boarman and Kristan 2006). This many-fold increase above historic levels and a shift from a migratory species to a resident species is due in large part to recent human subsidies of food (e.g., road kills, landfills, trash, garbage dumps, and agricultural developments), water, and perching and nest sites (e.g., fence posts, power poles and towers, signs, buildings) (Boarman 1993, USFWS 1994, Boarman and Berry 1995). At these elevated population levels, common raven predation on desert tortoise hatchlings and juveniles has shifted the composition of the desert tortoise population to predominantly adult desert tortoises by removing a substantial proportion of hatchling and juvenile desert tortoises in some areas, thus adversely affecting recruitment (Berry et al. 1986).

The extent and effect of common raven predation on desert tortoises is well known, but the impact of coyote predation has not been well researched. It is known that coyotes prey on desert tortoises and that the predation is greatest near human-made habitats (Esque et al. 2010), but whether this predation affects the demography of tortoise populations in unknown (Boarman 2014). Esque et al. (2010) found that female desert tortoises were more likely than males to be killed by coyotes. This might be because adult female tortoises are generally smaller than adult males. The body size of the tortoise in relation to the coyote’s gape may explain why males fall prey to coyotes less frequently than females. The higher prevalence of predation on females could lead to biased sex ratios if this pattern were to persist and could potentially lead to local extirpations (Esque et al. 2010).

Coyotes have been observed preying upon numerous adult desert tortoises within local areas, especially in times of drought. The effect of coyote predation likely varies with annual rainfall amounts; lower rainfall may cause coyotes to switch from their preferred prey of rodents, rabbits, and hares to less preferred tortoises (Boarman 2014). Nagy et al. (2015) released and monitored 53 juvenile desert tortoises between two and 15 years of age. These tortoises were hatched and head-started inside predator-resistant field enclosures. Survivorship through one year was similar for juveniles released in spring and autumn. After two years, most small juveniles had been killed by predators, but survivorship increased with body size and age. However, following a long drought during the previous two years, predation by coyotes was heavy on larger juveniles in the third year after release.

Domestic and free ranging/feral dogs are also documented threats to captive and wild desert tortoises (Bjurlin and Bissonette 2001, Boarman 2002). The threat of dogs depredating on desert tortoises is increasing with the growing number and sizes of cities, towns, and settlements in the desert. Individual dogs or packs may roam miles from home, dig up, and injure or kill desert tortoises (USFWS 2011). WS-California may recommend that domestic dogs be kept within sight and voice control; and free-ranging/feral dogs might be live captured or lethally removed by WS-California. In 2003 and 2004, WS-California contracted with Edwards Air Force Base to remove feral dogs which in part benefited local desert tortoise populations.

Desert Tortoise Critical Habitat

Critical habitat was designated for the Mojave population of the desert tortoise in 1994 (59 FR 5820). The USFWS has determined that the physical and biological features that support nesting, foraging, sheltering, dispersal, and gene flow are essential to the conservation of the desert tortoise (59 FR 5820). Desert tortoise habitat consists of the following physical and biological elements: 1) sufficient space to support viable populations within each of the six recovery units and provide for movements, dispersal, and gene flow; 2) sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species; 3) suitable substrates for burrowing, nesting, and overwintering; 4) burrows, caliche caves, and other shelter sites; 5) sufficient vegetation for shelter from temperature extremes and predators; and 6) habitat protected from disturbance and human-caused mortality (59 FR 5820).

In California, critical habitat designation totals 4,754,000 acres in Imperial, Kern, Los Angeles, Riverside, and San Bernardino counties. Of this, 3,327,400 acres are BLM land and 242,200 acres are military land. The remainder includes 132,900 acres of state land and 1,051,500 acres that are privately owned (USFWS 1994). The critical habitat units in California are: 1) Fremont-Kramer Unit, 2) Superior-Cronese Unit, 3) Ord-Rodman Unit, 4) Chuckwalla Unit, 5) Pinto Mountain Unit, 6) Chemehuevi Unit, 7) Ivanpah Unit, and 8) Piute-Eldorado Unit.

MINIMIZING MEASURES

WS-California will utilize the following measures to minimize impact on desert tortoises.

- Vehicles will be kept to roadways or existing trails and WS-California personnel will be on alert for the presence of desert tortoise. In desert tortoise habitat, vehicles will travel at the posted speed limit. In areas where the speed limit is not posted or on unpaved roads, WS-California personnel will drive at a maximum speed of 25 miles per hour. When vehicles are parked in desert tortoise habitat during the active season for any length of time, upon return to the vehicle, the area will be checked prior to moving the vehicle. Personnel will walk around the vehicle, check the area, look under and adjacent to the vehicle, and around the vehicle's tires to ensure that no tortoises are present to avoid crushing a desert tortoise that may be attracted to the shade created by the vehicle. If a desert tortoise is found under a vehicle, that vehicle will not be moved until the tortoise has moved out from under the vehicle.

- If a tortoise is present in a location in which movement of a vehicle might cause the injury or death of a tortoise, personnel will wait to move the vehicle until the tortoise moves out of the area near the vehicle.

- Traps will be set in such a way as to minimize the likelihood of capturing desert tortoise.

    - Pan tensions will be set to exclude non-target species
    - Species-specific baits will be used

- All traps used by WS-California will be checked daily. This will allow for the release of any non-target species.

- If 1339 is used, the egg baits will be secured so that they cannot be moved from the location and are placed in areas where they are unlikely to be encountered by non-target wildlife. Pre-bait eggs will be placed and monitored by game cameras or personal observation to ensure non-target species are not consuming eggs prior to placing eggs treated with DRC-1339.

EFFECTS OF PROPOSED ACTION

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are not caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.17).

Effect of Technical Assistance Recommendations on Desert Tortoise

Recommendations made during technical assistance are the responsibility of the land/resource owner and are not carried out by WS-California. WS-California personnel provide these recommendations in an educational capacity and have no control over if or how those recommendations are implemented. As such, the impacts of these recommendations are not included in this BA because WS-California personnel do not physically implement nor have any authority to mandate these actions.

Effect of Proposed Predator Damage Management Action on Desert Tortoise

WS-California predator damage management methods are unlikely to have a negative impact on desert tortoises. The methods are highly species specific and unlikely to negatively impact desert tortoise individuals or the population.

- Nest removal/egg addling/egg oiling is used to encourage adult birds to leave the area or to suppress reproduction of bird species. These methods are species-specific and will have the possible beneficial effect of reducing avian predation on desert tortoise populations.

- Shooting is used to remove avian and mammalian predators of desert tortoise. WS-California uses shotguns, pistols, and rifles to remove problem animals on this project. Shooting performed by WS-California personnel is highly target specific as WS personnel are trained to only shoot identified targets and use a safe backdrop. Dogs are sometimes used to decoy coyotes; however, they are kept under control and unlikely to interact with desert tortoises. Therefore, shooting will have the possible beneficial effect of reducing local avian and mammalian predation on desert tortoises.

- DRC-1339 is a toxicant applied to egg baits targeting ravens. If used, the eggs are placed on platforms to reduce access to non-target animals and are secured to the platform so that birds cannot remove the egg from the placement location and move it to a place where non-target animals might have access to it. The platforms are pre-baited with eggs prior to placing treated eggs on the platform. The pre-bait eggs are monitored by camera or visual observation to determine if non-target species are feeding on them. These precautions make it unlikely that DRC-1339 use would negatively impact desert tortoises and have the possible beneficial effect of reducing avian predation on desert tortoises.

- Trapping methods used on this project including cage traps, padded foot-hold traps, cable restraints and bow nets are unlikely to capture a desert tortoise because of elements of the set. Species-specific baits are used. Pan tension, trigger mechanism, and placement make the capture devices more species-specific and reduce the likelihood of trapping a desert tortoise. In addition, the daily trap-check requirement allows for the unharmed release of any non-target animals captured. These minimizing measures make it unlikely that trapping methods used by WS-California would negatively impact desert tortoises and would have the possible beneficial effect of reducing avian and mammalian predation on desert tortoises.

- Site access/increased presence has a small potential to cause temporary disturbance of individual desert tortoises. Personnel will take every precaution to detect and avoid disturbing tortoises in any way; however, there is a small possibility that a tortoise could be inadvertently harmed by a vehicle despite these precautions.

- Euthanasia methods are specific to the target animal. These techniques are not expected to negatively impact desert tortoises and will have the positive impact of reduction of predation on desert tortoises.

Effects of the Proposed Action on Desert Tortoise Critical Habitat

Wildlife Services-California's IWDM activities generally have no long-term effects on critical habitat because:

- the proposed action does not include habitat alterations;
- soil disturbance is minor and would rarely occur in undisturbed sites;
- ground disturbance is minimized because vehicles are used only on existing roads and trails to the extent practical (in some places required);
- most activities involve no ground disturbance, and no vegetation is removed, cut, altered or destroyed by WS-California;
- there is no construction or major ground disturbance proposed;
- setting traps involves only minor ground disturbance;
- whereas a trapped animal may cause a four to five foot diameter "trap circle" of disturbed vegetation, the disturbance is localized and temporary, and does not cause adverse modification to critical habitat;
- coordination with land management agencies and landowners identifies sensitive areas to avoid; and
- there is no destruction or adverse modification of critical habitat.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future state, tribal, or private activities, not involving federal activities, which are reasonably certain to occur within the action area of the federal action considered in this BA. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The following future state, tribal, local, or private actions may affect the desert tortoise and result in direct mortality: habitat loss and fragmentation, reduction of habitat suitability, mortality from vehicle strikes, and other types of accidental take.

EFFECTS DETERMINATIONS

Actions to remove predators of desert tortoises should have a moderate beneficial impact on desert tortoise populations. For declining populations of long-lived animal species, such as the desert tortoise in much of the California deserts, annual mortality of juvenile tortoises should not exceed five percent to ensure recruitment of new individuals into the breeding population and to help return the population to stable numbers (Congdon et al. 1993, USFWS 2008). The removal of common ravens and coyotes would help slow and reverse the dramatic population declines in the western Mohave Desert and contribute to the long-term survival and recovery of the desert tortoise. Implementing actions that would have an immediate and beneficial impact is essential as the population of the desert tortoise has continued to decline (USFWS 2008).

All WS-California actions for this project require access to areas inhabited by desert tortoises by vehicle and on foot. This introduces the potential of a desert tortoise being injured or killed by a vehicle. Vehicles will be kept to roadways or existing trails and WS-California personnel will be on alert for the presence of desert tortoise. In desert tortoise habitat, vehicles will travel at the posted speed limit. In areas where the speed limit is not posted or on unpaved roads, WS-California personnel will drive at a maximum speed of 25 miles per hour. When vehicles are parked in desert tortoise habitat during the active season for any length of time, upon return to the vehicle, the area will be checked prior to moving the vehicle. Personnel will walk around the vehicle, check the area, look under and adjacent to the vehicle, and around the vehicle's tires to ensure that no tortoises are present to avoid crushing a desert tortoise that may be attracted to the shade created by the vehicle. If a desert tortoise is found under a vehicle, that vehicle will not be moved until the tortoise has moved out from under the vehicle. Because of these precautions, site access would be insignificant or discountable on desert tortoises. WS-California in reviewing these actions has determined the effects are insignificant or discountable.

WS-California has determined that its program to protect desert tortoises **may affect, but not likely to adversely affect** desert tortoises. **USFWS concurrence is requested.**

WS-California has further determined that the anticipated impacts from IWDM activities (gas cartridges, padded foothold traps, foot and neck snares, detection and decoy dogs, ground shooting, aerial shooting, and euthanasia methods) **may affect, but not likely to adversely affect** the federally protected desert tortoise in California. **USFWS concurrence is requested.**

In addition, WS-California has determined that its activities will result in **No Destruction or Adverse Modification** of desert tortoise critical habitat. **USFWS concurrence is requested.**

NEED FOR REASSESSMENT

This BA and the findings herein are based on the best current data and scientific information available. A new analysis and revised BA will be prepared if one or more of the following occurs: 1) new species information reveals effects in a manner or to an extent not considered in this assessment, or 2) the action is subsequently modified or it is not fully implemented as described herein which caused an effect that was not considered in this assessment.

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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
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777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer to:
FWS-IMP/KER/LA/RIV/SB-17B0158-21I1352

August 17, 2021
Sent Electronically

Dennis Orthmeyer
California State Director
Wildlife Services
Animal and Plant Health Inspection Service
3419A Arden Way
Sacramento, California 95825

Subject: Integrated Wildlife Damage Management for the Protection of Desert Tortoises within Imperial, Kern, Los Angeles, Riverside, and San Bernardino Counties, California

Dear Mr. Orthmeyer:

This letter responds to your request, dated June 7, 2021, for our concurrence with your determination that implementation of the subject project may affect, but is not likely to adversely affect, the federally threatened desert tortoise (*Gopherus agassizii*, tortoise) or its critical habitat. Your request and our response are made pursuant to section 7(a)(2) of the Endangered Species Act, as amended (16 U.S.C. 1531 et seq.).

Wildlife Services' proposed methods represent a continuation of their approach to integrated wildlife damage management (integrated management) to mitigate the negative effects that subsidized predators have on tortoise demographic rates, population stability, and longer-term species viability. This consultation is meant to clarify that such integrated management can occur throughout the range of the tortoise in California as well as at subsidies adjacent to tortoise habitat. Wildlife Services would continue to target primarily common ravens (*Corvus corax*) and coyotes (*Canis latrans*) but would cover other species if they are found to be depredating on or are a threat to tortoises, particularly translocated individuals or tortoises being repeatedly located by human observers. These species include the following mammals: American badger (*Taxidea taxus*), bobcat (*Lynx rufus*), feral/free-ranging dog (*Canis familiaris*), raccoon (*Procyon lotor*), red fox (*Vulpes vulples*), and striped skunk (*Mephitis mephitis*). Of these latter species, Wildlife Services has used lethal methods to remove one American badger and one striped skunk for the protection of tortoises between calendar years 2015 and 2020.

When Wildlife Services receives a request for wildlife-damage related assistance, trained and experienced employees determine the appropriate integrated management recommendation to implement by using a decision model specific to wildlife damage control (Slate et al. 1992). Using this decision model to assess problems and evaluate the effectiveness of the various methods available enables Wildlife Services to base recommendations on a variety of factors, including, but not limited to, the following: short-term and long-term effectiveness of the methods; possible restrictions due to laws, regulations, or site-specific conditions; environmental considerations; and cost. Non-lethal and preventative measures are given priority when appropriate and practicable. Concurrent with or immediately following integrated management, Wildlife Services or the requestor will conduct surveys to measures treatment effectiveness. Management strategies are then adjusted, modified, or discontinued, as needed, depending on Wildlife Services' evaluation of effectiveness results. Wildlife Services will provide technical assistance, physical wildlife exclusion, scarecrow as well as effigy placement, dog-aided detection, inactive and active nest destruction, egg addling, avicide DRC-1339 application, and ground and aerial shooting to mitigate the negative effects posed by subsidized tortoise predators.

To ensure that the proposed integrated management is not likely to adversely affect tortoises, Wildlife Services has proposed implementation of numerous protective measures, which include, but are not limited to, all personal will be alert for the presence of tortoises, vehicle traffic will be confined to roadways and open routes, and vehicle traffic on dirt roads and roads were speed limits are not posted will not exceed 25 miles per hour. When vehicles are parked in tortoise habitat for any length of time, upon return to the vehicle or before leaving the parked spot, personnel will walk around the vehicle, check the area, look under and adjacent to the vehicle, and around the vehicle's tires to ensure that no tortoises are present to avoid crushing a tortoise. If a tortoise is found under a vehicle, that vehicle will not be moved until the tortoise has moved out from under the vehicle. Additionally, if the avicide DRC-1339 is used, the egg baits will be secured so that they cannot be moved from the location and placed in areas where they are unlikely to be encountered by non-target wildlife. Pre-bait eggs will be placed and monitored by game cameras or personal observation to ensure non-target species are not consuming eggs prior to placing eggs treated with DRC-1339.

The proposed integrated management will benefit tortoise populations by making progress toward restoration of raven densities to near pre-subsidy levels. The Service expects that restoring raven densities to ≤0.58 ravens per square kilometer will increase the annual survival probability of 2- to 9-year-old tortoises by more than 30, throughout intensively managed areas (Holcomb et al. in revision). While tortoise population stability largely depends on adult survival above 95 percent, tortoise populations cannot maintain stability between generations if the survival rate of 0 to 9 year-old tortoises is too low to sufficiently replace the previous generations, particularly during periods of low adult survival. Consequently, tortoise populations in parts of the Mojave Desert have few tortoises that are under 30 years old and are not likely to persist in the absence of some level of subsidized predator control.

The Service described six primary constituent elements (which we now refer to as physical and biological features) in its designation of desert tortoise critical habitat (59 Federal Register 5820). The specific physical and biological features of desert tortoise critical habitat are: sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality. Wildlife Services' proposed action would not reduce the amount of space available to the tortoise or decrease habitat connectivity. Wildlife Services would use vehicles only on existing legal routes of travel; staff would travel away from roads on foot for its activities. Consequently, the proposed action would have insignificant effects on the tortoise's forage species, soil conditions, substrates, other shelter sites, and vegetation. Last, the activities conducted by Wildlife Services would cause discountable effects in relation to disturbance and human-caused mortality because its activities would be temporary and intermittent; additionally, its staff would be present in an insignificant area in relation to the area occupied by tortoises in California. Finally, the management of predators subsidized by human activities would promote the recovery of the tortoise.

Therefore, because integrated management of certain predators will benefit tortoise population viability and Wildlife Services will avoid injuring or killing tortoises through strict adherence to its proposed protective measures and will not disturb critical habitat, we concur with your determination that the proposed integrated wildlife damage management may affect, but is not likely to adversely affect, the tortoise or its critical habitat. This concludes consultation on the subject project. Wildlife Services must contact us immediately if: new information reveals effects of the action that may affect the tortoise or its critical habitat in a manner or to an extent not previously considered; the identified action is subsequently modified in a manner that causes an effect to the listed species or its critical habitat that was not considered herein; or a new species is listed or critical habitat designated that may be affected by the subject project (50 Code of Federal Regulations 402.16). At that time, we would determine whether further consultation is warranted.

If you have any questions, please contact Kerry L. Holcomb at 760 322-2070, extension 421.

Sincerely,

Rollie White

Digitally signed by ROLLAND WHITE
Date: 2021.08.17 09:55:05 -07'00'

Rollie White
Assistant Field Supervisor

Literature Cited

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Biological Assessment

Effects of Integrated Wildlife Damage Management for the Protection of Agriculture, Property, and Public Safety on Gray Wolves in California

Prepared by:

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Animal and Plant Health Inspection Service
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May 2020

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Acronyms

APHIS	Animal and Plant Health Inspection Service
BA	Biological Assessment
BLM	Bureau of Land Management
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FIFRA	Federal Insecticide, Rodenticide, and Fungicide Act
FR	Federal Register
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
MOU	Memorandum of Understanding
NRM DPS	Northern Rocky Mountain Distinct Population Segment
NWRC	National Wildlife Research Center
ODFW	Oregon Department of Fish and Wildlife
USDA	United States. Department of Agriculture
USFS	United States. Forest Service
USFWS	United States. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WS	Wildlife Services
WS-CA	Wildlife Services-California

Executive Summary

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services in California (WS-CA) conducts integrated wildlife damage management (IWDM) throughout California on public and private land, as requested. Integrated wildlife damage management would be conducted for the protection of agriculture, property, and human health and safety. In 2012, WS-CA completed an informal section 7 consultation with the United States Fish and Wildlife Service (USFWS) to address the possible effects on adult gray wolves (*Canis lupus*) in California. In the 2014 concurrence letter, the USFWS concurred with WS' effect determination of: may affect, not likely to adversely affect.

Due to the increased dispersal of gray wolves into California and the occurrence of pups recorded in 2015, 2017, 2018, and 2019, WS-CA is seeking to re-confirm the 2012 Informal Consult and provide the following for Biological assessment (BA) for consideration. This BA addresses the effects of WS-CA integrated wildlife damage management methods on adult and juvenile gray wolves in California. Despite using the conservation measures established in the 2012 Informal consult for adult gray wolves, plus additional conservation measures proposed in this assessment, WS-CA has determined that IWDM methods **may affect and are likely to adversely affect gray wolves in California**.

1.0 Introduction

1.1 Purpose of this Biological Assessment

This BA evaluates the potential effects of IWDM conducted by WS-CA on federally listed gray wolves (*Canis lupus*) under section 7 of the federal Endangered Species Act (ESA) of 1973, as amended. WS-CA is the Action Agency, and lead federal agency for this ESA consultation. The proposed project is located in California anywhere IWDM is used in response to wildlife related damage to agriculture, property, natural resources, and human health and safety within the range of the gray wolf. The potential effects of WS-CA IWDM methods on adult gray wolves were evaluated in an informal section 7 consultation request that was submitted to the USFWS in 2012. In a letter dated April 15, 2014, the USFWS concurred with WS-CA's **may affect, not likely to adversely affect** determination if WS-CA follows the measures approved by the USFWS to protect adult gray wolves when conducting IWDM.

The number of dispersing adult gray wolves in California is increasing, and gray wolf pups have been documented in California in 2015, 2017, 2018, and 2019. In light of this, it can be expected that other breeding pairs may establish territories in California. Therefore, WS-CA is preparing this analysis evaluating the effects of WS-CA program on gray wolf adults and juveniles. Given the potential for rapid changes in wolf populations, the duration of this consultation is 5 years from the date the USFWS signs the biological opinion for this consultation.

1.2 Consultation History

- On July 8, 2004, WS-CA requested a formal section 7 consultation on all of its programs and rescinded the prior requests for informal consultation. This request was later divided into two parts: Part I reviewed the program to protect threatened and endangered species from predation in California under formal consultation. Part II reviewed the IWDM program to protect livestock, human health and safety, property, and natural resources in the State of California under informal consultation.

- On May 9, 2012, WS-CA submitted an amendment to the USFWS to revise and replace the September 8, 2008 amendment with new program information. This included an informal section 7 consultation on San Joaquin kit fox (*Vulpes macrotis*), California condor (*Gymnogyps californianus*), desert tortoise (*Gopherus agassizii*), and adult gray wolf.

- On April 15, 2014, WS-CA completed the May 9, 2012 informal section 7 consultation amendment that included California condor, desert tortoise, and adult gray wolf.

- On June 14, 2016, the USFWS confirmed the validity of 2007-2014 informal consultations including findings on adult gray wolves.

1.3 Authorities

Wildlife Services is authorized by Congress to protect American agriculture and other resources from damage associated with wildlife by providing assistance to agencies, organizations, and individuals in resolving wildlife conflicts. The Act of March 2, 1931 (46 Stat. 1468-69, 7 U.S.C §§ 8351-8352) states: "*The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in* *conducting the program….*" The Act of March 2, 1931, as amended (7 U.S.C. § 8351 – Predatory and other wild animals and § 8352 – Authorization of expenditures for the eradication and control of predatory and other wildlife animals), authorizes the Secretary of Agriculture to conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary deems necessary in conducting the program. The Secretary of Agriculture has delegated this authority to Wildlife Services (WS Directive 1.210: Legal Authority). The Act was amended in 1987 (The Act of December 22, 1987 (Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 8353)) to further provide: "*On or after December 22, 1987, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control Activities.*"

2.0 Project Description

2.1 Wildlife Services-California Overview

USDA is authorized to protect American agriculture and other resources from damage associated with wildlife. Wildlife Services is authorized and directed to resolve conflicts involving animals preying on or harassing livestock and wildlife, damaging property or threatening human health and safety. In California, this function is carried out by WS-CA. WS-CA is a collection of cooperative programs with other federal, state, local agencies, private individuals, and associations to protect livestock, poultry, natural resources, property, and human safety from wildlife threats and damage. WS-CA conducts technical assistance (education, information, and advice), and operational assistance to resolve human conflicts with wildlife. Operational assistance is provided in the form of preventative (in response to historical losses) and corrective (in response to current loss or threats/hazards) wildlife damage management on federal, state, county, municipal, tribal, and private lands at the request of the land or resource owner while operating under memoranda of understanding (MOUs), cooperative agreements, or agreements for control. All wildlife damage management is based on interagency relationships, which require close coordination and cooperation because of overlapping authorities and legal mandates.

WS-CA uses Annual Work Plans and *Work Initiation Documents for Wildlife Damage Management* signed by the land or resource owner to describe the species that will be managed and which methods will be used to alleviate or reduce damage on specific parcels. WS CA during the annual planning process with federal agencies such as US Forest Service (USFS), Bureau of Land Management (BLM), prepares plans and maps which describe and delineate where management may be conducted and which methods will be used.

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and control of damage caused by wildlife based on analysis and the informed judgment of trained personnel. The philosophy behind IWDM is to implement effective management techniques in a cost effective manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. IWDM may incorporate cultural practices (i.e. animal husbandry), habitat modification, animal behavior (i.e. hazing), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems. Consideration is given to the following factors before selecting or recommending control methods and techniques:

- Species responsible for damage
- Magnitude, geographic extent, frequency, and duration of the problem
- Status of target and non-target species, including threatened and endangered species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of control options
- If prevention efforts (non-lethal and lethal techniques) fail to stop damage, what other strategies can be implemented.

Under the current program, WS-CA receives requests for assistance from and may enter into cooperative agreements with private landowners, livestock managers, Native American Indian tribal land managers, cooperating counties, BLM, USFWS, USFS, CDWR, CDFW, CDFA, and other federal, state, county, and municipal agencies. The methods used in the current program include 1) technical assistance methods such as recommending animal husbandry, fencing, frightening devices, chemical repellents, and hazing, and 2) operational control methods such as fladry, padded-jaw foothold traps, cage traps, snares, shooting, aerial hunting, and the use of trained dogs. Most IWDM methods have recognized strengths and weaknesses relative to each specific predator damage situation. WS-CA personnel can determine for each IWDM activity what method or combination of methods is most appropriate and effective using the Wildlife Services Decision Model (Slate et al. 1992). A number of methods are available for consideration in the process. WS-CA conducts operational control activities on lands where signed *Work Initiation Documents for Wildlife Damage Management* (formally called Agreements for Control on private/Non-private Property) have been executed. These agreements list the intended target animals and methods to be used. In some cases with public land agencies, a MOU serves as these Work Initiation Documents for control activities.

2.1.1 Types of Management Assistance

- <u>Technical Assistance Recommendations</u> are the responsibility of the requestor to implement. WS-CA personnel provide information, demonstrations, and advice on many of the available IWDM techniques. Technical assistance includes demonstrations on the proper use of management devices (propane exploders, turbo fladry and its maintenance cage traps, etc.) and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Technical assistance is generally provided by WS-CA personnel following an on-site visit or a verbal consultation with the requestor for short and long-term solutions to damage problems. These strategies are based on the level of risk, the abilities of the requestor, need, and practical application. Technical assistance may require substantial effort by WS-CA personnel in the decision making process, but the actual management is primarily the responsibility of the requestor.

- Operational Assistance are activities conducted or supervised by WS-CA personnel. Operational assistance is implemented when the problem cannot effectively be resolved through technical assistance and when Cooperative Agreements provide for WS-CA operational assistance. The initial investigation defines the nature and history of the problem, extent of the damage, and the species responsible for the damage. Professional skills of WS-CA personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or if the problem is too complex and requires the direct supervision of a wildlife professional. WS-CA considers the biology and behavior of the damaging species and other factors using the Wildlife Services Decision Model (Slate et al. 1992). The recommended strategy (ies) may include any combination of proactive and reactive actions that could be implemented by the requestor, WS-CA, or other agencies, as appropriate. However, reactive management, that which is applied in response to a loss with the intent of abating or reducing further losses, is most often used. Proactive management, the application of damage management strategies prior to damage occurring, is applied less frequently, usually in areas with historical, chronic, damage problems.

2.1.2 Types of Management with the Potential to Affect Wolves

- IWDM actions not targeting wolves includes management directed toward other wildlife (Table 2.1) that is conducted in proximity to wolves, but does not target wolves. Some of the methods used in this management are lethal, however WS-CA will use mitigating measures discussed in this document to reduce the likelihood of them affecting wolves.

Table 2.1: Species that WS-CA typically targets that the methods may have the potential to affect gray wolves.

Common Name	Scientific Name
American badger	*Taxidea taxus*
Beaver	*Castor canadensis*
Black bear	*Ursus americanus*
Bobcat	*Lynx rufus*
Coyote	*Canis latrans*
Feral/free-ranging dog	*Canis lupus familiaris*
Gray fox	*Urocyon cinereoargenteus*
Mountain lion	*Puma concolor*
Red fox	*Vulpes vulpes*

- IWDM actions targeting wolves includes the use of nonlethal management techniques such as fladry/turbo fladry (Davidson-Nelson and Gehring 2010), range riding, carcass management, and site presence. These methods are typically limited to a location and temporary in nature with the intent of protecting livestock (Lance et al. 2010) from wolves.

2.2 Methods/Devices Used in IWDM with the Potential to Affect Wolves

Non-lethal and preventative measures are given priority when appropriate and practicable. These are often methods that are discussed as technical assistance such as animal husbandry and habitat or animal behavior modifications. The methods listed in this section are methods typically used by WS-CA to resolve wildlife damage management issues after non-lethal measures have been deemed ineffective.

Some of the methods discussed below can be used to non-lethally to restrain an animal. Target animals are rarely relocated, especially with species that are numerous such as coyotes or striped skunks. Translocation of wild animals is discouraged by Wildlife Services policy (WS Directive 2.501; USDA 2018) because of the stress to the relocated animal; poor survival rates due to intraspecific strife with established resident animals of the same species; and because of difficulties in adapting to new locations and habitats. Relocation of captured problem animals is also opposed by the American Veterinary Medical Association (AVMA), the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists because of the risk of disease transmission among wildlife mammals. In addition, it is against California state law to relocate wild mammals (14 CCR § 465.5(g) (1)). In those rare instances that WS-CA relocates an animal, it will be at the request of CDFW or USFWS.

2.2.1 Ground Shooting

WS-CA personnel may either provide advice regarding ground shooting for predators as part of technical assistance or provide the service themselves. Ground shooting with firearms is highly selective for target species. WS-CA employees undergo training to properly identify coyotes and juvenile wolves in low ambient light conditions. Shooting can be selective for offending individuals and has the advantage that it can be directed at specific damage situations. The majority of shooting occurs in rural areas on both private and public lands, as well as airports for health and human safety. Shooting is sometimes used as one of the first lethal damage management options because it offers the potential of resolving a problem quickly and selectively. Shooting is limited to locations where it is legal and safe to discharge a weapon.

Calling and shooting is a technique which uses electronic devices that broadcast recorded or artificial wildlife sounds in the immediate area and are intended to draw specific species to an area where they can be lethally removed with a firearm Calls are often played for short bursts and cause minimal disturbance.

Tools such as spotlights, night vision devices, and thermal imagery for night shooting; and decoy dogs, predator calling, stalking, and/or baiting may be used to increase ground shooting efficiency and selectiveness. Spotlights are often covered with a red lens which nocturnal animals may not be able to see, making it easier to locate them without them. Night shooting may be conducted in sensitive areas that have high public use or other activity during the day, which would make daytime shooting unsafe. The use of night vision and Forward Looking Infrared (FLIR) devices can also be used to detect and shoot predators at night. Coyotes and red foxes that may be trap-wise, and therefore difficult to trap, are often responsive to simulated predator calling.

To ensure safe use and awareness, WS-CA employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within three months of their appointment and a refresher course annually thereafter (WS Directive 2.615; USDA 2018). The use and possession of firearms must be in accordance with federal, state, and local laws and regulations (WS Directive 2.210; USDA 2018). WS-CA personnel must adhere to all safety standards of firearm operation as described in the Wildlife Service Firearms Safety Training Manual. Such personnel are subject to drug testing when considered for hire, randomly, when under reasonable suspicion, and after accidents have occurred. All employees who use firearms are subject to the Lautenburg Domestic Confiscation Law, which prohibits firearm possession by anyone convicted of a misdemeanor crime or domestic violence. WS-CA complies with applicable state laws, and statutes, methods for ground shooting.

While on duty, WS-CA employees are authorized to store, transport, carry, and use only the firearms necessary to perform official WS-CA duties. The maximum type of security available must be used to secure firearms when not directly in use and to ensure that unauthorized access is prevented. No firearms shall be left unattended unless securely stored. Authorization is required for leaving firearms stored in vehicles overnight. Ammunition, pyrotechnic pistols, net guns, dart guns, air rifles, and arrow guns will be stored securely unloaded as determined by the State Director.

The CDFW, commercial operators, and landowners/resource owners can also use ground shooting for IWDM, in compliance with state laws and regulations.

2.2.2 Snares

Snares can be used for live-capture and release, for holding for subsequent euthanasia, or for a direct kill, depending on how and where they are set. Snares are made of strong, lightweight cable, with a locking device, and are used to capture animals by the neck, foot, or body. Snares are often set on animal travel corridors, such as under fences or trails through vegetation.

When an animal steps into the cable loop place horizontally on the ground, a spring is triggered and the cable tightens around the foot to hold the animal. If the snare is placed vertically, the animal walks into the snare and the neck or leg is captured or entangled. On standard cable snares, snare locks are typically used to prevent the loop from opening again once the loop has closed around an animal. Loop stops can also be incorporated to prevent the loop from either opening or closing beyond a minimum or maximum loop circumference, which can effectively exclude non-target animals or allow for the live-capture of target animals.

Most snares are also equipped with a swivel to minimize injuries to the captured animal and reduce twisting and breakage of the snare cable. Breakaway devices can also be incorporated into snares, allowing the loop to break open and release the animal when a specific amount of force is applied. These devices can improve the selectivity of cable restraints to reduce non-target species capture, however only when the non-target species is capable of exerting a greater force to break the loop than the target species.

The Collarum™ is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes and foxes. It is activated when an animal bites and pulls a cap with a lure attractive to canids, whereby the snare is projected from the ground up and over the head of the coyote or fox. As with other types of snares, the use of the Collarum device to capture coyotes is greatly dependent upon finding a location where coyotes frequently travel. A stop on the device limits loop closure. The trigger is designed specifically for canines, and uses a distinct pulling motion to set off the device.

In general, cable restraints are available to all entities to alleviate damage within state law. Snares offer several advantages over padded-jaw foothold traps by being lighter to transport or carry and not being as affected by inclement weather.

2.2.3 Live Capture Traps

These traps include box type traps intended for mountain lions or feral swine, culvert traps, and cage traps targeting smaller and medium sized meso-mammals and live capture beaver traps such as basket or Hancock traps. They are typically set with a bait or lure to encourage the target species to enter the trap. A trigger mechanism usually located at the back of the trap is triggered by the animal and the trap closes. The animal is enclosed in the trap and held until it is subsequently released or euthanized. Because the animal is held alive, if a non-target animal is captured, it can usually be released unharmed.

2.2.3.1 Cage Trap

Cage traps vary in size and shape depending on the species being targeted. Large cage traps are occasionally used by WS-CA for the capture of coyotes, red foxes, feral dogs, feral swine, and mountain lions. WS-CA defines large cage traps as being larger than 12”x12”x36”, but not culvert traps. Bobcat or coyote-size cage traps are made of welded wire, utilize a treadle type trigger system and close with a spring or gravity door. Large cage traps for the more powerful animals are typically constructed of commercial livestock panels made of 3/16” galvanized welded rods. The top, sides, front, and bottom panels are welded together and panel openings are approximately 2”x4”. These cage traps may have a treadle type trigger and a single-catch, multi-catch or gravity door and can easily be transported by vehicle.

Selecting an appropriately sized cage trap for a specific damaging animal can limit non-target captures by physically excluding them from the trap. Traps are set near signs of damage or near known travel areas. Cage traps are almost always baited and baits can be altered to be further selective of target species. Cage traps set by WS-CA are checked daily by WS-CA personnel, the landowner/manager, or their designated agent.

WS-CA most commonly uses cage traps near homes and outbuildings in urban/suburban areas, but may also be used in rural locations. Non-target animals are generally released with little or no injury. Target animals are euthanized, released on site (e.g., disease surveillance or population monitoring), or relocated when appropriate and as approved by the CDFW.

2.2.3.2 Padded-jaw Foothold Traps

Padded-jaw foot-hold traps can be used in California for the protection of public safety and of threatened and endangered species (In Nat. Audubon Society v. Davis (N.D. Cal. 2000) 144 F. Supp. 2d 1160, the United States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of this method for the protection of threatened and endangered species.)

Padded-jaw foot-hold traps are used for live-capture and release or hold for subsequent euthanasia. They are made of steel with springs that close the jaws of the trap around the foot of the target species. Padded-jaw foothold traps are equipped with a pan tension device that is set to trigger the trap based on the weight of the targeted species and exclude smaller non-target species. Padded-jaw foothold traps may have offset padded jaws, which hold the animal while reducing the risk of injury. These traps usually permit the release of non-target animals unharmed.

Traps are placed in the travel paths of target animals and some are baited or scented, using an olfactory attractant, such as the species' preferred food, urine, or musk/gland oils. The use of baits also facilitates the prompt capture of target predators by increasing the chances that the target animal will be attracted to the trap. In some situations a draw station, a carcass, or large piece of meat, is used to attract target animals. In this approach, one or more traps are placed in the vicinity of the draw station. Wildlife Service Directive 2.450 prohibits the placement of traps closer than 30 feet to the draw station to reduce the risk to non-target animals (USDA 2018).

The traps can be staked to the ground securely, attached to a solid structure (such as a tree trunk or heavy fence post), or used with a drag that becomes entangled in brush to prevent trapped animals from escaping. Anchoring systems should provide enough resistance that a larger animal that is unintentionally captured should be able to either pull free from the trap or be held to prevent escaping with the trap on its foot.

Effective trap placement also contributes to trap selectivity. To minimize risk of capturing non-target animals, the user must be experienced and consider the target species' behavior, habitat, environmental conditions, and habitats of non-target animals. The pan tension, type of set, and attractant used greatly influences both capture efficiency and risks of catching non-target animals. The level of trap success is often determined by the training, skill, and experience of the user to adapt the trap's use for specific conditions and species. When determining how often to check traps, the user must balance the need for avoiding unnecessary disturbance of the trap area and humaneness of trapping to the captured animals. The California Code of Regulations (CCR), Title 14 §465.5 (g) (2) requires that "…*all traps shall be visited at least once daily by the owner of the traps or his/her designee. Each time traps are checked all trapped animals shall be removed*." WS-CA follows state law and regulations regarding the setting and checking of traps and snares per Wildlife Service Directives 2.450 and 2.210 (USDA 2018).

2.2.3.3 Culvert Trap

Culvert traps are a type of trap with differing trigger systems, gravity doors, constructed of solid material as compared to welded wire or livestock panels used in large cage traps, and are often on a wheeled platform or trailer for transport. WS-CA often uses this type of trap when dealing with black bears that are in urban/suburban settings; although they can also be used in rural areas and for other species. Due to the size and weight of most culvert traps, they are primarily restricted for use near roadways, although models exist that may be disassembled and reconstructed in remote areas. Depending on the nature of the damage problem, culvert traps may be baited with the carcass of livestock that was killed by the target bear or other species. Baits similar to those that are attracting bears in urban/suburban environments may also be used. WS-CA implements a daily trap check for all culvert traps. Non-target animals are generally released with little or no injury, and target animals are usually euthanized or relocated as appropriate and when authorized by the CDFW.

2.2.4 Use of Trained Dogs

Decoy dogs are sometimes used to lure coyotes within shooting distance. These dogs are kept under control of personnel and are unlikely to interact with wildlife.

Detection dogs are used to identify sites where equipment may be effective by indicating where mountain lions, bears, coyotes, or other predators have traveled, urinated, or defecated. They are kept under the control of personnel and are unlikely to interact directly with wildlife.

Trailing dogs are used by WS-CA to trail mountain lions, feral swine, and black bears. Dogs are trained to find and follow the scent of the target species. The dogs, are tracked with GPS collars and stay with the animal until WS-CA personnel arrive and then anesthetize, dispatch, or release, depending on the situation. For instance, WS-CA personnel assist CDFW by collaring mountain lions with new radio telemetry collars, replacing old collars, and monitoring collared mountain lions using dogs. Dogs are trained to ignore the scents of non-target species.

2.2.5 Quick-Kill/Body Gripping Traps

Quick-kill traps are frequently used by WS-CA to capture various mammals and rodents. Quick-Kill traps come in a variety of styles, including body-gripping, snap (rat or mouse variety), gopher and mole traps. The body-gripping trap is lightweight, easily set, and consists of a pair of rectangular wire frames that close when triggered, killing the captured animal with a quick body blow. The most commonly used trap is the Conibear® which is set in waterways to lethally take beaver. When applied for this use, the traps are set underwater in the entrances of beaver lodges, in underwater travel corridors, or near areas at or near a beaver dam or other beaver activity. Body-gripping traps set to capture muskrat are used mostly in shallow water den entrances or underwater travel corridors. Conibear sets for nutria, river otter or mink may be set similar to beaver and muskrats. Smaller body-gripping traps (jaw spread less than 6 inches) can be used on land in trees and buildings for a variety of animals (i.e. ground squirrels). WS policy prohibits the use of body-gripping traps with a jaw spread exceeding 8 inches for land sets (APHIS-WS Directive 2.450). Smaller-sized traps may also be set in the entrance of a wooden box or other structure having food or bait placed inside so the animal will trigger the trap when attempting to access the bait. Quick-kill traps set for beaver, nutria, mink, and muskrat may be used in both urban and rural areas and set types generally preclude non-target animals from capture Quick-kill traps are lethal to both target and non-target animals.

Per the CCR, Fish and Game Code (FGC) §4004(e) it is unlawful to "*use a conibear trap that is 6 inches by 6 inches, unless partially or wholly submerged in water. Unless prohibited by the department [CDFW] as a permit condition, a lawfully set conibear trap that is 10 inches by 10 inches or less may be set pursuant to*" 14 CCR §465.5(g).

Per 14 CCR §465.5(g) conibears "*…with a jaw larger than 8 inches by 8 inches may be used only in sets where the trap is wholly or partially submerged in water or is: A) within 100 feet of* *permanent water, B) within 100 feet of seasonally flooded marshes, pastures, agricultural lands, or floodways when standing or running water is present, and C) within the riparian vegetation zone, characterized by, but not limited to, willow, cottonwood, sycamore, salt cedar, cattail, bulrush and rushes, when found within the area defined in section 463(a) where the take of beaver is permitted*."

2.2.6 Gas Cartridges

Denning is the practice of locating coyote, red fox, and striped skunk dens and taking the young and/or adults by using a registered gas fumigant cartridge. This method is used to manage present depredations of livestock by coyotes, red fox, and striped skunks, or anticipated depredation from coyotes. When the adults are killed and the den site is known, denning is used to euthanize the pups and prevent their starvation. Denning is highly selective for the target species responsible for damage. Den hunting for coyotes and red foxes is often combined with other damage management activities such as aerial shooting and ground shooting.

Gas cartridges are normally applied in rural settings on both private and public lands. When dens are selected for fumigation, the fuse of the gas cartridge is ignited and hand-placed at least three to four feet inside the active den. Soil is then placed in the den entrance to form a seal to prevent the carbon monoxide from escaping and oxygen entering. Sodium nitrate is the principle active chemical in gas cartridges and is a naturally-occurring substance. When ignited, the cartridge burns in the den, depleting the oxygen and producing large amounts of carbon monoxide, a colorless, odorless, tasteless, poisonous gas.

The use of gas cartridges may pose a risk to non-target animals that may also be found in burrows of target predators. Given the omnivorous nature of target predator diets, non-target rodents, reptiles, or amphibians are highly unlikely to occur in a coyote or fox den. WS-CA conducts pretreatment site surveys to identify signs of use by non-target species including wolves (such as tracks or scat).

All animals removed by denning are humanely euthanized per Wildlife Services Directives 2.425 and 2.505 (USDA 2018) the gas cartridges used for denning (EPA Reg. No. 56228-21-ZA) are registered by Wildlife Services with CDPR. All pesticides used by WS-CA are registered under the Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) and administered by the Environmental Protection Agency (EPA) and CDPR. All WS-CA personnel who apply registered-use pesticides are state-certified pesticide applicators and have specific training by WS-CA for pesticide application per Wildlife Service Directive 2.465 (USDA 2018).

2.2.7 Aerial Operations

Aircraft, both fixed-wing and rotary-wing (helicopters) are used by WS-CA to remove coyotes. The most frequent aircraft used for aerial shooting and hazing is the fixed-wing aircraft Piper PA-18 Super Cub and Cub Crafters CC-18 Top Cub and rotary-wing Hughes MD500. WS-CA conducts aerial activities on areas only under signed agreements or federal Annual Work Plans, and concentrates efforts to specific areas during certain times of the year. During technical assistance, WS-CA may advise cooperators to hire private operators with CDFW permit for aerial shooting of coyotes. Additionally, WS-CA may conduct the work operationally at the request of cooperators.

Aerial shooting consists of visually sighting target animals in the problem area and shooting them with a firearm from an aircraft. Aerial shooting is species-specific and can be used for immediate damage relief, providing that weather, topography and ground cover conditions are favorable. Aerial shooting can be effective in removing offending animals that have become trap-shy or are not susceptible to calling and shooting or other methods. This method may also be used proactively to reduce local coyote predations in lambing and calving areas with a history or predation.

Fixed-wing aircraft are useful for aerial shooting over flat and gently rolling terrain. Because of their maneuverability, helicopters have greater utility and are safer over timbered areas or broken land where animals are more difficult to spot. Aerial shooting typically occurs in remote areas with low densities of tree or vegetation cover, where the aerial visibility of target animals is greatest. WS-CA spends relatively little time flying and shooting over any one area.

Wildlife Services Directive 2.620 and Wildlife Services aircraft-use policy help ensure that aerial shooting is conducted in a safe and environmentally sound manner, in accordance with federal and state laws (USDA 2018). State Directors and District Supervisors are responsible for the supervision, management, and compliance for all aviation activities within California, and all aircraft used in WS-CA activities through contract, agreement, or volunteer shall have been approved by the office of the Wildlife Services National Aviation Coordinator. Wildlife Services Directive 2.615 guides all Wildlife Services shooting activities (USDA 2018). All efforts are conducted in strict compliance with the Wildlife Services Aviation and Safety Manual, the Federal Aviation Regulations, the Fish and Wildlife Act of 1956 (Airborne Hunting), any applicable State and local laws and regulations, WS-CA Aviation Safety Plan, Aviation Communication Plans, and Aviation Emergency Response Plans.

Wildlife Services has an Aviation Training and Operations Center located in Cedar City, Utah. Its mission is to improve aerial operations safety and provide training and guidance for Wildlife Services aviation personnel and aerial activities. The policy and primary focus of WS-CA and contract aviation personnel is ensuring the well-being through safety and accident prevention efforts. Pilots and aircraft must be certified under established WS-CA procedures. Only properly trained WS-CA employees are approved crewmembers. Ground crews are often used with aerial operations for safety and for providing assistance with locating and recovering target animals.

2.2.8 Fladry/Turbo Fladry

Fladry is single strand of polyline with flagging attached (Young et al. 2015). Turbo fladry is electrified as in an electric fence. The key to fladry is that it is most effective when it is installed to be highly visible (UCCE 2019). Since turbo fladry is electrified, it tends to be effective longer (Lance et al. 2011) as when a wolf tests the fladry it is shocked. WS-CA both recommends turbo fladry and sometimes assists landowners with the installation of turbo fladry. Fladry and turbo fladry are temporary alterations to habitat. Turbo fladry may provide livestock owners' temporary relief (Davidson-Nelson and Gehring. 2010) and is probably only effective for a timeframe measured in months (UCCE 2019). It is recommended that once livestock are moved or wolf activity at the site decreases, that the turbo fladry be removed.

2.2.9 Site Access/Increased Presence

Before WS-CA conducts any wildlife damage management, a request must first be received and *Work Initiation Documents for Wildlife Damage Management* must be signed by the landowner/administrator for private lands or other comparable documents for public or tribal lands must be in place. WS-CA uses 4-wheel drive vehicles, all-terrain vehicles (ATVs), snow machines, aircraft, or hoof stock for conveyance when conducting IWDM activities. When operating on federally or state owned lands, all WS-CA compliance terms and conditions are set forth in WS-CA MOUs with land management agencies.

Increasing human activity in an area can sometimes dissuade wildlife from using or hunting in that area. WS-CA does not currently assist with increasing activities (e.g. Range Riding, night fire vigilance) in an area to decrease wolf activity at a location; however, it is something that may be done in the future. This would be temporary activity.

2.3 Technical Assistance

A wide range of non-lethal management tools are recommended by WS-CA for IWDM, but are implemented by the landowner/manager. Compliance with applicable federal, state, and local laws and regulations is the responsibility of the landowner/resource owner implementing the methods. Consequently, these methods are not included in this consultation because they are not implemented by WS-CA. Below are some examples of these types of methods for informational purposes.

- <u>Cultural methods</u>: crop selection, livestock guarding animals, timing of harvest and grazing patterns to avoid periods/locations of greatest risk, carcass removal, herders, and shed lambing
- <u>Habitat management:</u> install permanent fencing systems and remove vegetation to minimize cover where target animals might hide
- <u>Human behavior management:</u> reducing bone piles and carcass disposal sites

2.4 Species Description

Gray wolves are the largest wild members of the Canidae, or dog family, with adult males typically ranging from 43 to 45 kilograms (kg) (95 to 100 pounds (lbs.)) and adult females, ranging from 36 to 39 kg (80 to 85 lbs.) (Mech 1970, p. 11). Wolves are typically 1.5 to 1.8 meters (5 to 6 feet) in length from nose to tail tip. Most wolves stand 66 to 81 cm (2 to 2.5 feet) tall at the shoulder. Tracks are normally 11 to 14 cm (4 to 5.5 inches) long (USFWS 1987).

Gray wolves have long legs that are well adapted to running, allowing them to move fast and travel far in search of food, and large skulls and jaws, well suited to catching and feeding on large mammals (Mech 1970, pp. 13-14). Wolves also have keen senses of smell, hearing, and vision, which they use to detect prey and one another. Pelt color varies in wolves more than in almost any other species, from white, to grizzled gray, to coal black (Mech 1970, pp. 15-16).

Wolves are highly territorial, social animals and group hunters, normally living in packs of 7 or less, but sometimes attaining pack sizes of 20 or more wolves (Mech 1970, pp. 38-40; Mech and Boitani 2003, p. 8, 19). Packs are family groups consisting of a breeding pair, their pups from the current year, offspring from the previous year, and occasionally an unrelated wolf (Mech 1970, p. 45; Mech and Boitani 2003, p. 2). Normally, only the top-ranking male and female in each pack breed and produce pups, although sometimes maturing wolves within a pack will also breed with members of the pack or through liaisons with members of other packs (Mech and Boitani 2003, p. 3). Litters are born from early April into May and can range from 1 to 11 pups, but generally include 5 to 6 pups (Mech 1970, p. 119; Fuller et al. 2003, p. 176). Normally a pack has a single litter annually, but 2 litters from different females in a single pack have been reported and in one instance 3 litters in a single pack have been documented (reviewed by Fuller *et al*. 2003, p. 175). Offspring remain with their parents from 10 to 54 months before dispersing, meaning that packs may include offspring from up to 4 breeding seasons (Mech and Boitani 2003, p. 2).

Reproductive Information

The following information on gray wolf reproduction, growth, and development was gathered from Mech and Boitani (2003). Gray wolves begin to reproduce when they are two to three years of age. Females are capable of producing pups every year after their first breeding. Typically a pack produces only one litter of pups per year regardless of the number of adult females present. Litter size can vary significantly, but four to seven pups is the average litter size.

- Birth to four months (0-30 lbs.): Wolf pups are usually born in a den. Pups have a fast growth rate during their first four months of life. At birth they cannot see or hear and weigh about one pound. The female wolf does not leave the den for the first few weeks, relying on the male parent to provide her food. Pups first emerge from the den at around three weeks of age but remain at the den site until a gradual weaning process begins at five to six weeks. At this age pups may follow adults at least one mile from the den. After weaning, adult pack members regurgitate meat for the pups or bring smaller prey back to the den to feed them. At eight to 10 weeks of age the den site is abandoned and the pups are moved to a rendezvous site within three miles of the den site. By 12 weeks of age, pups are mature enough to accompany adults on hunts and return to the rendezvous site on their own.

- Four to seven months (30-50 lbs.): Pups will gain approximately 1.3 pounds per week. Adult teeth and pelage grow in and pups can accompany adults on hunts for larger prey. By the end of this period their appearance is nearly indistinguishable from adult wolves.

- Seven months to one year (50-90 lbs.): This is a period of slow growth. Females gain 0.07 pounds per week and males gain 0.4 pounds per week. They begin to actively hunt.

One and a half to three years (70-110 lbs.): Sexual maturity and dispersal period begins.

Wolves are flexible and opportunistic predators, but large ungulates are their primary prey (Peterson and Ciucci 2003, p. 104). In the western United States, elk (*Cervus elaphus*) and deer (*Odocoileus* spp.) make up the bulk of their diet, with the proportion of each appearing to be primarily dependent on their relative availability in a given area. Wolves also readily scavenge carrion, particularly dead ungulates, and opportunistically prey on smaller species such as rabbits and beaver (*Castor canadensis*). Wolf scat collected in Yellowstone National Park in 1998 contained voles, ground squirrels, snowshoe hare, coyote, bear (*Ursus* spp.), insects and vegetation (MDFWP 2001).

Wolves will also prey on livestock where their ranges overlap, although the degree to which this occurs is highly variable and influenced by many site-specific factors (Bradley and Pletscher 2005, p. 1263). In some situations, wolves repeatedly target livestock, while in other areas they co-occur largely without incident (Bradley and Pletscher 2005, Morehouse and Boyce 2011). Boneyards, where dead livestock carcasses have been piled over many years, are often frequented by wolves, particularly during winter, and they can draw wolves into close contact with livestock (Morehouse and Boyce 2011).

A pack establishes an annual home range or territory and defends it from trespassing wolves. These territories vary widely in size, from 33 to 2,600 square kilometers (km^2) (13 to >1,016 square miles (mi^2)) (Mech and Boitani 2003, pp. 21-22; Fuller et al. 2003, pp. 172-175). The large variability in territory size is likely due to differences in pack size; prey size, distribution, and availability; population lags in response to changes in prey abundance, and variation in prey vulnerability (Mech and Boitani 2003, pp. 21-22).

In northwestern Montana during 1999, the average territory size for 8 packs was 479 km^2 (185 sq. mi), ranging from 62 to 1,590 km^2 (24 to 614 mi^2). Territories in the Greater Yellowstone Area were even larger, averaging 891 km^2 (344 mi^2), with a range of 85 to 2,419 km^2 (32.5 to 934 mi^2), for 11 packs. Central Idaho wolf packs have the largest average territory size with 932 km^2 (360 mi^2), ranging from 365 to 1,821 km^2 (141 to 703 mi^2) for 13 packs (USFWS *et al.* 2001).

From late April until September, pack activity is centered at or near the den or rendezvous sites as adults hunt and bring food back to the pups. One or more rendezvous sites are used after pups emerge from the den. These sites are often in meadows or forest openings near the den, but sometimes are several kilometers away. Pups travel and hunt with the pack by September. The pack hunts throughout its territory until the following spring. The attributes of each pack's territory vary widely (*e.g.*, elevations, land use patterns, prey species and abundance) so it is difficult to generalize about wolf territory use (MDFWP 2001).

When wolves reach sexual maturity, some remain with their natal pack while others leave to find a mate and start a pack of their own. Dispersers may become nomadic and cover large areas as lone animals, or they may locate suitable unoccupied habitat and a member of the opposite sex to establish their own territorial pack (Mech and Boitani 2003, pp. 11-17). Between 1979 and 1997, radio-collared wolves in northwestern Montana typically dispersed from their natal territory when they were 2 to 3 years old (29 months on average for males and 38 months for females) and traveled an average distance of 97 km (60 mi); 113 km (70 mi) on average for males and 78 km (48 mi) for females (Boyd and Pletscher 1999, p. 1094). Dispersal distances for all tracked wolves ranged from 16 to 255 km (10 to 158 mi), with the exception of one yearling female that travelled 840 km (522 mi) (Boyd and Pletscher 1999, p. 1100).

Although infrequent, extreme long-distance dispersal events of greater than 300 km (187 mi) were observed over a dozen times by radio-collared wolves in the Rocky Mountains from 1992 through 2008, with one dispersing over 1,090 km (680 mi) with an actual travel distance exceeding 9,650 km (6,000 mi) (USFWS *et al.* 2009, p. 2). These long-distance dispersals may be more prevalent at the periphery of a population's range where there is unoccupied habitat in some directions. In 2011, a radio-collared wolf from northeastern Oregon dispersed over 600 km (372 mi) from its natal area into unoccupied regions of southern Oregon and northern California (ODFW 2011).

Wolves die from a variety of natural causes, including starvation, injuries while hunting prey, disease, and intraspecific conflicts (Fuller *et al.* 2003, p. 176). Human-caused sources of mortality include control actions in response to livestock depredations, harvest, illegal killing, and vehicle collisions. Because of their high reproductive potential, wolf populations can withstand a high rate of mortality. Studies of wolf mortality rates in Alaska and Minnesota suggest that human take of wolves can reach 35% annually without permanently reducing a wolf population (Fuller 1989, Fuller *et al.*2003, pp. 184-185).

2.5 Legal Status and Information about Gray Wolves in the U.S.

Gray wolves are federally (January 4, 1974; 39 FR 1171-1176) and State (January 1, 2017) listed as endangered under the Endangered Species Act (ESA) and the California Endangered Species Act (CESA), respectively. Gray wolves were likely extirpated from California in the 1920s, and from most of their range across the lower 48 states by the mid-1930s. A few populations of gray wolves remained in northeastern Minnesota, Isle Royale, Michigan, and in the northern Rocky Mountains (USFWS 2011a). A small population of gray wolves from Canada began to naturally recolonize northwestern Montana, reaching about 65 individuals by 1994. Then in 1995 and 1996 the USFWS reintroduced two populations of gray wolves, one in central Idaho and the other in Yellowstone National Park, Wyoming. From those two reintroductions gray wolves have since expanded their range. Current gray wolf populations in Oregon, Washington, the Northern Rocky Mountain Region, and the Western Great Lakes Region are discussed below.

Gray wolves use distance/directional dispersal to take them to a new population or to the very edge of their range. Wolves of both sexes have dispersed to areas up to 531 miles away from their natal territories (Mech and Boitani 2003). The record dispersal lengths of males and females tend to be about the same. However dispersal distance and rate can vary depending on the region or time (Mech and Boitani 2003). The most common age of dispersal is 11-24 months and pups that disperse during their first year usually leave their natal pack from January to May (Mech and Boitani 2003). Their territories range in size from 50 square miles to more than 1,000 square miles, depending on the available prey and their seasonal movements (USFWS 2011b).

2.6 Legal Status and Population of Gray Wolves Outside of California

<u>Northern Rocky Mountain Gray Wolf Population</u>

The Northern Rocky Mountain (NRM) gray wolf population includes Montana, Idaho, and Wyoming. In 2015, the population was estimated to be more than 1,704 wolves in more than 282 packs, including 95 breeding pairs. Breeding pairs consist of packs containing at least one male, one female, and two or more pups on December 31, 2015. The minimum recovery goal of at least 300 wolves and 30 breeding pairs in the NRM states for at least three years (managed to maintain over 150 wolves and 15 breeding pairs in each state) has been exceeded since 2002. The NRM wolf population continues to expand west from the original NRM distinct population segment (DPS) boundary into eastern Oregon and Washington (USFWS 2016).

In 2008, the USFWS published a final rule to remove gray wolves in the NRM DPS from ESA protection. This rule was later challenged in federal court and, consequently gray wolves were placed back under federal protection. The USFWS again published a final rule to remove the NRM wolf population, excluding Wyoming, from protections of the ESA in 2009, but the rule was vacated by a federal judge in 2010 which again restored protections to gray wolves in the NRM DPS. In 2011, President Obama signed the Department of Defense and Full-Year Appropriations Act, a section of which directed the Secretary of the Interior to reissue the 2009 delisting rule for the NRM DPS excluding Wyoming. As a result, gray wolves in the other NRM DPS states, including the eastern third of Washington and Oregon, were once again removed from ESA protections (WDFW et al. 2018). Wolves in Wyoming were later federally delisted in April of 2017 after multiple legal challenges were resolved (82 FR 20284).

<u>Gray Wolves in Washington</u>

The eastern third of Washington was included in the NRM DPS designation to account for dispersing wolves from populations in Idaho and Montana, although federal recovery requirements were only applicable to those states in the original Northern Rocky Mountain Wolf Recovery Plan. Gray wolves in the western two-thirds of Washington continue to be listed under the provisions of the ESA and are presently classified as an endangered species under federal law. In Washington, gray wolves are classified as an endangered species under state law (WAC 220-610-010) regardless of federal classification (WDFW et al. 2018). The Washington Department of Fish and Wildlife (WDFW) developed the Wolf Conservation and Management Plan for Washington, which was formally adopted by the WDFW Commission in December 2011. This plan serves as a guide to the recovery and management of gray wolves as they naturally recolonize the state. At the end of 2019, Washington State's minimum year-end wolf population increased by 11 percent and marks the 11th consecutive year of population growth. As of December 31, WDFW counted 108 wolves in 21 packs of which 10 were successful breeding pairs in 2019 (WDFW 2020).

<u>Gray Wolves in Oregon</u>

Gray wolves occurring west of Oregon Highways 395/78/95 continue to be federally protected as endangered under the ESA. The Oregon Fish and Wildlife Commission removed gray wolves from the Oregon List of Endangered Species on November 9, 2015. The eastern Oregon population of gray wolves—which is part of the NRM DPS—are classified as a "special status game mammal" and is managed by the Oregon Department of Fish and Wildlife (ODFW) (ORS 496.004(9)). In the federally listed portion of Oregon, the ODFW implements the Oregon Wolf Conservation and Management Plan under the guidelines of the federal/State Coordination Strategy. The USFWS makes management decisions regarding harassment and take of wolves and assists in monitoring and depredation prevention (ODFW 2017, 2018, 2019). The minimum known count of wolves in Oregon at the end of 2019 was 158 wolves. That count increased by 15% from the 2018 minimum known number of 137. At the end of the year, 22 packs were documented and 19 of those packs met the criteria as breeding pairs. In addition, nine groups of two or three wolves were identified. Resident wolf activity was identified in 32 separate geographic areas and 12 counties including parts of Baker, Douglas, Grant, Jackson, Klamath, Lake, Lane, Morrow, Umatilla, Union, Wallowa, and Wasco.

2.7 Legal Status and Information about Gray Wolves in California

In September 2011, a radio collared male gray wolf (known as OR-7) of Oregon's Imnaha pack dispersed from his natal pack and began traveling in a southwesterly course. On December 28, 2011, OR-7 crossed into California northeast of Dorris, a small town in Siskiyou County. OR-7 crossed the California/Oregon border several times before mating and establishing a territory in Oregon's Klamath and Jackson counties in 2013, forming the Rogue Pack (CDFW 2018a). Two pups from OR-7's 2014 litter have been detected in California: the breeding male of the Lassen pack (CA08M) and another (CA10F) detected in eastern Siskiyou County in 2017. One pup (OR-54), likely from the 2016 litter was detected in California in 2018 (CDFW 2018d).

OR-7's presence in California prompted members of the public to petition the California Fish and Game Commission (Commission) to list the gray wolf as endangered under the CESA. On June 4, 2014, the Commission made the finding that the listing was warranted and voted to list the gray wolf under the CESA. Gray wolves were officially listed as endangered under the CESA on January 1, 2017. Kovacs et al. completed the Conservation Plan for Gray Wolves in California (2016).

Since OR-7's initial entry into California, other gray wolves have continued to disperse from Oregon into California. The majority of dispersal activity has occurred in Lassen, Modoc, Shasta, and Siskiyou counties, CA.

<u>Shasta Pack</u>

The Shasta Pack was California's first known contemporary pack. The pack occupied a portion of eastern Siskiyou County and produced five pups in the spring of 2015. There were no verified detections of the pack between late November 2015 and early May 2016, when a yearling male (CA07M) was detected by trail cameras, tracks, and scat near several pup-rearing sites the pack had used in 2015. In November 2016, the same male (verified through genetic analysis of scat) was observed in northwestern Nevada. The CDFW believe that the pack no longer exists, although some evidence suggests at least one wolf was roaming within and near the Shasta Pack territory in the summer and fall of 2017 (CDFW 2018b).

<u>Lassen Pack</u>

The Lassen Pack is California's second contemporary pack, and only currently known pack. These wolves are utilizing a broad area of western Lassen and northernmost Plumas counties. The pack's female (LAS01F) was first detected with a trail camera in August 2015. In February 2016, biologists first encountered the tracks of what appeared to be two wolves traveling together; these two wolves were then regularly detected during the following summer and fall. Genetic testing indicated the male wolf (CA08M) was born into Oregon's Rogue Pack in 2014. LAS01F is not closely related to known Oregon wolves, and is therefore suspected to have dispersed from another part of the broader northern Rocky Mountain wolf population (CDFW 2018d). In 2017, the pair produced at least four pups, three of which were known to be alive in late March 2018 (CDFW 2018b). LAS01F was fitted with a GPS tracking collar in late June 2017 and CDFW biologists regularly monitor her whereabouts until her collard failed 2019. LAS01F was suspected to have given birth to pups on April 18, 2018, as indicated by both ground and satellite tracking data. On June 29, trail camera video confirmed reproduction with a minimum count of two pups (CDFW 2018c). In early 2019, cameras indicated a minimum of five adult and yearling wolves in the pack. The pack had a third litter in 2019. As of early July 2019, CDFW estimated the pack consisted of a minimum of two to three adults/yearlings and three pups. One of the 2019 pups (LAS02F) was fitted with a satellite tracking collar in September 2019 which operated for a few months and has now stopped transmitting.

There are several known disperser wolves that are active or have been active in California. CDFW maintains a document that summarizes wolf activity in California: California's Known Wolves – Past and Present. Current information about wolf movement and activity in California can be found here: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=174789&inline.

2.8 Minimization Measures

Ongoing WS-CA IWDM activities incorporate a number of "minimization measures" that are inherent to the action to effectively avoid or minimize taking or killing an adult or juvenile wolf under this proposed action. WS-CA personnel use a professional decision model when developing strategies to address all requests for assistance with wildlife damage (see Figure 2.1; Slate et al. 1992). Consideration is given to a variety of factors including the presence of and potential risk to non-target species including threatened and endangered species. WS-CA employees are specially trained in techniques to recognize and minimize risks to non-target and threatened and endangered species. In the 2012, the USFWS provided a Gray Wolf Informal consultation on the USDA APHIS California Wildlife Services Program Part II which was signed 4/15/2014. The Fish and Wildlife Service determined that the use of gas cartridges, leghold traps, neck and foot snares, beaver traps, and shooting may affect, but are not likely to adversely affect, the gray wolf in California. However, since that time there have been four wolf litters, which have provided known age breeders, and pioneering young. In addition, wolves immigrating into California have also increased. With the increased movement of Wolves throughout northern California and that WS CA is closely following all provided previous and suggested mitigation measures WS-CA has determined that IWDM methods may affect and are likely to adversely affect gray wolves in California.

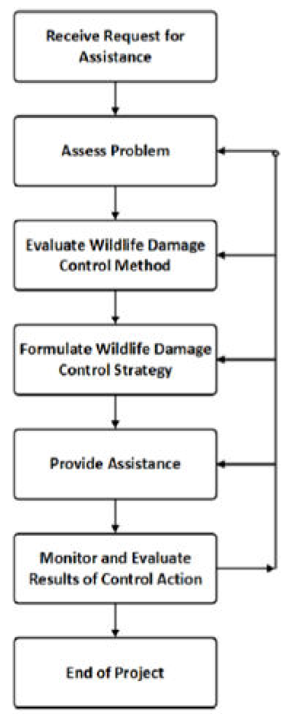

Figure 2.1: WS Decision Model as presented by Slate et al. (1992) for developing a strategy to respond to a request for assistance with human-wildlife conflicts.

WS-CA personnel will participate in and initiate if necessary, interagency wolf calls, monthly conference calls, and intermittent wolf resource calls, which will inform WS-CA, USFWS, and CDFW of new local movements, cluster points from radio collar data, and potential livestock kill locations involving wolves in CA. In addition, evolving policy, and procedures involving gray wolves promulgated by state and federal wildlife management agencies will be discussed. This continual communication between CDFW, USFWS, and WS-CA will allow all to be informed of the status of gray wolves in California.

WS-CA conducts IWDM activities throughout California. The action area of this BA includes occupied wolf range (USFWS 1994), which, as established in the 2012 consultation and for the purpose of this consultation, WS-CA defines "occupied gray wolf range" as areas of confirmed presence of resident breeding packs or pairs of gray wolves or areas consistently used by ≥ one resident gray wolf or wolves over a period of at least one month. Specifically, an area of

a. 5-mile radius around all locations of gray wolves and wolf sign confirmed as described above (non-radio monitored),
b. 5-mile radius around radio locations of resident gray wolves when < 20 radio locations are available (for radio monitored gray wolves only), or
c. 3-mile radius around the convex polygon developed from ≥ 20 radio locations of a pack, air, or single wolf taken over a period of ≥ 6 months (for radio-monitored gray wolves).

Following are the minimizing measures established during the 2012 consultation which are still being followed: "2012 USFWS Gray Wolf Informal consultation on USDA APHIS California Wildlife Services Program Part II signed 4/15/2014."

APHIS-WS has determined that the use of gas cartridges, leghold traps, neck and foot snares, beaver traps, and shooting may affect, but are not likely to adversely affect, the gray wolf in California. We provide our concurrence based on the following reasoning:

A. *Confirmation of wolf presence is to be made or corroborated by the U.S. Fish and Wildlife Service (Service) and/or the California Department of Fish and Wildlife (CDFW). APHIS-WS personnel will participate in interagency wolf monitoring programs and will keep its specialists apprised of the status of wolves in California and provide them with the locations of confirmed wolf presence.*

B. *With the passage of Proposition 4 in 1998, all steel jawed leg-hold traps were banned for use in the state of California. Therefore, APHIS-WS will not use these types of traps in California, eliminating this threat to the gray wolf.*

C. *When the presence of a wolf is confirmed by the Service or CDFW, APHIS-WS will rely on information on the wolf's location from one or both agencies, or other agencies and tribes as they may be involved with wolf monitoring in order to take measures to preclude injuring or killing a wolf while conducting predator management operations.*

The following measures will be used for the activities that may affect wolves in areas occupied by gray wolves:

- *All #3 Soft-Catch traps, which are used in public safety and for the protection of endangered species (primarily Sierra Nevada bighorn sheep, which occurs outside the current range of the gray wolf) will be staked solidly, so that an adult wolf would be expected to pull free from these traps. If soil conditions were such that there was some question about whether the stake might be pulled out of the ground by an adult wolf, then an extended chain with drag will be attached to the trap.*

- *Breakaway neck and foot snares can be used in areas known to be occupied by gray wolves. These types of snares are not expected to injure or harm the gray wolves. Non-breakaway neck snares will not be used in areas known to be occupied by gray wolves unless wolves are the target species. While there is no proposal at this time to target wolves, potentially, APHIS-WS may be requested to assist with live or lethal wolf capture for the purposes of fitting radio collars, relocating a wolf, or managing livestock or human safety threats. Wolves would not be targeted without further consultation with the Service.*

- *Conibear traps and non-breakaway snares set for beaver shall be set underwater in areas known to be occupied by federally protected gray wolves. We do not expect that gray wolves will come into contact with these devices because they will be underwater.*

- *The Service's Pacific Southwest Regional Office and CDFW shall be notified as soon as possible of the finding of any dead or injured gray wolf according to the 2012 coordination plan. Cause of death, injury, or illness, if known, also shall be conveyed to those offices.*

WS-CA's assessment of effects includes the implementation of these additional measures that will be used for the activities that may affect wolves in areas occupied by gray wolves.

1. All traps and snares have the potential to capture or haze juvenile wolves. Therefore, these devices will not be used within 1 mile proximity to any known occupied den sites, rendezvous sites, or areas of recently documented pup activity from June 1 to to October 1 each year, unless approved on a case-by-case basis by USFWS. These dates are based on the reproductive information section above and correspond to the timeframe when young wolves would become more mobile (i.e., start to travel some distance from a den or rendezvous site).

2. All dog work has the potential to capture or haze wolves, and therefore will not be used within 1 mile proximity to occupied den sites, rendezvous sites, or areas of recently documented pup activity from June 1 to October 1 each year, unless approved on a case-by-case basis by USFWS. These dates are based on the reproductive information section above and correspond to the timeframe when young wolves would become more mobile (i.e., start to travel some distance from a den or rendezvous site).

3. In areas of new gray wolf activity, WS CA will follow all minimization measures identified above will remain in effect for a 2-week period after new wolf activity is documented. WS CA after two weeks of monitoring and having made three attempts to search the location and finding no additional wolf sign or activity, WS-CA will resume regular activities in the area.

3.0 Effects of the Proposed Action

3.1 General Discussion

Potential impacts on gray wolves could be associated with accidental injury or death as a non-target animal, occurring during efforts to reduce damage caused by other wildlife such as damage to livestock, damage to property, threats to human health and safety, and damage to natural resources. In addition, non-lethal efforts such as fladry and increased human presence could result in changes to normal behavior such as avoidance of certain parts of territory or moving of a den site. Currently, there is no designated critical habitat for gray wolves in California, therefore critical habitat will not be discussed.

3.2 Effects of the Proposed Action on the Gray Wolf

The potential for incidental take does exist due to the increase in dispersing individuals from other states, established Lassen Pack, and the occurrence of pups in California. The risk of incidental take may increase as gray wolves become more prevalent in California.

The proposed WS CA activities that could adversely affect gray wolves are the lethal predator control activities that are undertaken to minimize livestock losses. Direct hunting activities, such as aerial or ground-based shooting of targeted animals, are not expected to result in incidental take of gray wolves because WS CA specialists are skilled at identifying their targets and sufficiently cautious that we do not expect them to inadvertently shoot a wolf. However, the use of remotely deployed predator control devices such as neck snares, foothold traps placed for public safety, and trialing hounds used in mountain lions and black bears capture could potentially harm or kill gray wolves or pups.

Since fiscal year (FY) 2005, there has been 34 unintentional captures of gray wolves or Mexican gray wolves (*Canis lupus baileyi*) by Wildlife Service across all state programs. Of those 34 unintentional captures by Wildlife Services nationwide only 6 wolves were captured by neck snares or padded foot-hold traps; Tools allowed in California (see Table 3.1). No federal-listed or state-listed gray wolves have been captured or taken by WS-CA since their first documented reoccurrence in the state in September 2011.

Table 3.1: The number of gray wolves and Mexican gray wolves unintentionally captured by neck snares and padded foot-hold traps by Wildlife Service in all states from FY 2005 – FY 2019 during routine IWDM activities.

Fiscal Year	States	Number killed (method)	Number freed (method)	Other (method)	Total
2005	ND	1 (neck snare)			1
2006	ID	1 (neck snare)		-	1
2007	No non-target or unintentional wolves captured with neck snare or padded foothold				
2008	No non-target or unintentional wolves captured with neck snare or padded foothold				
2009	No non-target or unintentional wolves captured with neck snare or padded foothold				
2010	No non-target or unintentional wolves captured with neck snare or padded foothold				
2011	NM	-	-	2 (padded foothold trap), relocated	2

2012	NM			1 (padded foothold), relocated	1
2013	NM	1 (firearm)			1
2014	WY	1 (neck snare)		-	1
2015	No non-target or unintentional wolves captured with neck snare or padded foothold				
2016	No non-target or unintentional wolves captured with neck snare or padded foothold				
2017	No non-target or unintentional wolves captured with neck snare or padded foothold				
2018	No non-target or unintentional wolves captured with neck snare or padded foothold				
2019	No non-target or unintentional wolves captured with neck snare or padded foothold				
Total		4	0	3	**7**
Average/year		0.28	0.0	0.20	**0.46**

Wolf populations in the states listed in Table 3.1 (North Dakota, Montana, Wyoming, Idaho, Oregon, New Mexico, and Wisconsin) are significantly higher than in California. See previous discussions in section 2.5 regarding gray wolf numbers in the Pacific Northwest, Northern Rocky Mountain Region, and the Great Lakes Region.

APHIS – Wildlife Service activities in North Dakota, Montana, Wyoming, Idaho, Oregon, New Mexico, and Wisconsin are similar to WS-CA in that many of the species targeted, and resources protected comprise the majority of the activities. It is notable that WS-CA utilizes a restricted tool list as compared to WS actions in other states as we have chosen to comply with state laws which banned the use of M-44's and steel jawed traps. Looking at a recent history of Wildlife Service unintentional take in other states provides an indication (albeit an exaggerated one due to California's small wolf population and no use of M-44 devices or steel jawed traps) of the potential for incidental take of gray wolves in California.

The most recent 14-year average unintentional take nationwide is 2.4 wolves per year for all forms of take. If sources of unintentional take that are not expected to occur in California (e.g., shooting, steel jawed traps, and M-44's) are removed from Table 3.1 the average drops to 0.46 per year. The potential for WS-CA to incidentally take a federally-protected gray wolf while conducting IWDM activities in California is based on the dispersal behavior described in section 2.5, the presence of pups, and the expected increase in the number of future wolves in California,.

Although minimizing measures will be taken in occupied wolf range, not everything can be anticipated. A wolf might be unintentionally captured with a foothold, cage trap, or snare. While these traps typically allow release of non-target captures, there is potential for a wolf to injure itself while pulling out of a trap such as a snare or foothold.

The use of trained dogs, especially for trailing has the potential to cause disturbance and change in behavior if wolves are in the area. Minimizing measures would limit exposure to this activity to wolves with previously unknown locations.   Trailing hounds are trained to ignore nontarget species but their presence while temporary in nature may cause disturbance.

Additionally, nonlethal actions designed to target gray wolves involved in conflicts with livestock may cause disturbance to gray wolves. These actions include site access, increased presence, and installation of fladry. While the intent of these actions is to temporarily discourage wolves from using the immediate area of a livestock conflict, these actions would be focused in nature and not affect an individual or packs ability to otherwise shelter, hunt or behave normally. As such the effects of these actions are considered minor and temporary in nature.

3.3 Cumulative Effects

Cumulative effects are those effects of future state, tribal, or private activities, not involving federal activities, which are reasonable certain to occur within the action area of the federal action considered in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The following future state, tribal, local, or private actions may affect the gray wolf and result in direct mortality: unauthorized human-induced mortality from vehicle strikes or other types of accidental take, and unauthorized illegal take (poaching). Therefore, as wolves continue to disperse into new areas, there may be an increase in the likelihood of effects on wolves.

3.4 Determination

WS-CA has determined that its IWDM activities in California "may affect and is likely to adversely affect" federally protected gray wolves in California. WS-CA has further determined that the anticipated impacts from IWDM activities (gas cartridges, padded-jaw foothold traps, foot and neck snares, tracking and trailing hounds, ground shooting, aerial shooting, and beaver trapping) may capture and/or kill gray wolves. No critical habitat is designated in California and WS-CA activities do not affect the habitat of the gray wolf.

4.0 Need for Re-assessment Based on Changed Conditions

This BA and the findings are based on the best current data and scientific information available. This new analysis was prepared since one or more of the following occurred: 1) new species information reveals effects in a manner or to an extent not considered in this assessment; or 2) the action is subsequently modified or it is not fully implemented as described herein which caused an effect that was not considered in this assessment (such as if WS-CA is requested to assist with intentional wolf capture).

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
TAILS# 08EKLA00-2020-F-0072

July 21, 2020

Dennis Orthmeyer
State Director
APHIS-Wildlife Services
California State Office
3419A Arden Way
Sacramento, CA 95825

Subject: Biological Opinion for the Effects to the Gray Wolf from APHIS-Wildlife Services' Integrated Wildlife Damage Management Activities in California

Dear Mr. Orthmeyer:

This correspondence replies to your May 1, 2020, request for formal section 7 consultation with the U.S. Fish and Wildlife Service (Service) on the effects of the U.S. Department of Agriculture, Animal and Plant Health Inspection Services, Wildlife Services (APHIS-WS) Integrated Wildlife Damage Management (IWDM) Activities in California on the gray wolf (*Canis lupus*). Your request for consultation is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.; hereafter referred to as the Act or ESA). Our response to your request is based on the biological assessment accompanying your letter, various phone and email correspondence, and information in our files. This correspondence transmits our biological opinion for the subject action.

The IWDM activities will be implemented within the range of the gray wolf in California. The APHIS-WS is proposing the following IWDM activities: ground shooting, snares, live capture traps, trained dogs, quick kill/body gripping traps, gas cartridges, aerial operations, fladry/turbo fladry, and site access/increased presence. Minimization measures will be implemented to reduce the impacts of the proposed action to the gray wolf. These measures reduce or avoid potential effects to juvenile or adult gray wolves from IWDM activities (e.g., seasonal restrictions and buffers). The biological assessment includes a determination that the proposed action “may affect and is likely to adversely affect” the gray wolf. Our biological opinion regarding the potential effects of the proposed action on the gray wolf is enclosed.

As mentioned in your letter, AHPIS-WS previously consulted with the Service on the IWDM activities and their potential effects to other federally listed species. Therefore, these species will not be further addressed in this document.

The Service appreciates your efforts in completing consultation on this project. Although some adverse impacts to gray wolves may result, APHIS-WS has made a concerted effort to include design components that will avoid or minimize those adverse effects. We recognize the time and commitment put into this effort by your staff. If you have any questions regarding the subject matter, please contact Elizabeth Willy at 541-885-2525.

Sincerely,

DANIEL BLAKE

Digitally signed by DANIEL BLAKE
Date: 2020.07.21 10:53:57 -07'00'

Daniel D. Blake
Field Supervisor

Enclosure: Biological Opinion for the Effects to the Gray Wolf from APHIS-Wildlife Services' Integrated Wildlife Damage Management Activities in California; 08EKLA00-2020-F-0072

cc: Shannon Chandler, Environmental Coordinator, APHIS-WS California
Shannon Herbert, Environmental Coordinator, APHIS-WS California
Steven Schoenberg, Acting Section 7 Coordinator, USFWS Interior Region 10, Sacramento, California

Biological Opinion for the Effects to the Gray Wolf
from APHIS-Wildlife Services'
Integrated Wildlife Damage Management Activities
in California

(TAILS # 08EKLA00-2020-F-0072)

July 21, 2020

U.S. Fish and Wildlife Service
Klamath Falls Fish and Wildlife Office
Klamath Falls, Oregon

Table of Contents

1.0 INTRODUCTION

Background

This document contains the U.S. Fish and Wildlife Service's (Service) biological opinion, based on our review of the Animal and Plant Health Inspection Service, Wildlife Services' (APHIS-WS) proposed action to fund and implement its integrated wildlife damage management (IWDM) program activities in California that may affect gray wolves (*Canis lupus*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The APHIS-WS is a Federal agency within the United States Department of Agriculture (USDA).

The purpose of the IDWM activities performed by APHIS-WS employees is to resolve conflicts involving wildlife preying on or harassing livestock, damaging property, or threatening human health and safety. This consultation addresses the effects of those activities on gray wolves in California where they are federally listed as endangered. Critical habitat is not designated for gray wolves; therefore, it will not be addressed further. Given the potential for rapid changes in wolf populations, the analyses contained in this biological opinion are valid for five years from the date of this biological opinion, unless reinitiation of consultation is triggered (see section 10.0 below).

This biological opinion is based on the biological assessment titled "Effects of Integrated Wildlife Damage Management for the Protection of Agriculture, Property, and Public Safety on Gray Wolves in California" dated May 2020 (USDA 2020, entire) and information in our files. A complete record of this consultation is on file at the Klamath Falls Fish and Wildlife Office.

Consultation History

July 8, 2004: The APHIS-WS California State Office (WS-California) requested formal section 7 consultation on all of its programs and rescinded prior requests for informal consultation. The request was later separated into two parts: Part I reviewed the program to protect threatened and endangered species from predation in California under formal consultation. Part II reviewed the IWDM program to protect livestock, human health and safety, property, and natural resources in the State of California under informal consultation.

May 9, 2012: WS-California submitted an amendment to the Service to amend the previous consultation with informal section 7 consultation on San Joaquin kit fox (*Vulpes macrotis*), California condor (*Gymnogyps californianus*), desert tortoise (*Gopherus agassizzii*) and adult gray wolf.

April 15, 2014: The Service completed informal consultation on the May 9, 2012, WS-California wildlife damage management activities, Part II, including gray wolves (08E00000-2014-I-0011).

June 14, 2016: The Service responded to a request for confirmation of the validity of previous informal consultations for IWDM activity effects to gray wolves (FWS/R8/AES).

April 7, 2020: WS-California shared a draft biological assessment for potential effects from its IWDM activities on juvenile and adult gray wolves with the Service. The Service provided comments on the draft biological assessment on April 13, 2020.

May 1, 2020: The Service received a request for formal section 7 consultation from WS-California along with a biological assessment for the proposed actions.

2.0 PROPOSED ACTION

The following description of the proposed action is based primarily on information contained in the Assessment (USDA 2020, pp. 7-16, 23-25).

2.1 California Wildlife Services Program Overview

The USDA is authorized to protect American agriculture and other resources from damage associated with wildlife. The APHIS-WS is authorized and directed to resolve conflicts involving animals preying on or harassing livestock and wildlife, damaging property or threatening human health and safety. The primary statutory authority of APHIS-WS is the Animal Damage Control Act of March 2, 1931, as amended (7 U.S.C. 426-426c; 46 Stat. 1468). APHIS-WS activities are conducted in cooperation with other federal, state, and local agencies, as well as private organizations and individuals.

The activities conducted by WS-California are part of a collection of cooperative programs with other federal, state, and local agencies; private individuals; and associations to protect livestock, poultry, natural resources, property, and human safety from wildlife threats and damages. The WS-California conducts technical assistance (education, information and advice), and operational assistance to resolve human-wildlife conflicts. Operational assistance is provided in the form of preventive (taking proactive measures) and corrective (in response to current loss or threats/hazards) wildlife damage management on federal, state, county, municipal, tribal, and private lands at the request of the land or resource owner. This assistance is in conjunction with an existing Memorandum of Understanding, cooperative agreement, or other agreement for control. Overlapping authorities and legal mandates place an emphasis on interagency relationships, requiring close coordination and cooperation.

WS-California uses Annual Work Plans and Work Initiation Documents for Wildlife Damage Management (signed by the land or resource owner) to describe the species to be managed and which methods will be used to alleviate or reduce damage on specific parcels. During the annual planning process, plans and maps are prepared such that management is directed toward individual offending animals and/or localized problem predator groups depending on the circumstances.

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. The IWDM activities include the implementation and application of safe and practical methods for the prevention and control of damage caused by wildlife based on analyses and the informed judgment of trained personnel. The philosophy behind IWDM is to implement effective management techniques in a cost effective manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. The IWDM activities draw from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. IWDM may incorporate cultural practices (i.e. animal husbandry), habitat modification, animal behavior (i.e. hazing), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems. Consideration is given to the following factors before selecting or recommending control methods and techniques:

- Species responsible for damage
- Magnitude, geographic extent, frequency, and duration of the problem
- Status of target and non-target species, including threatened and endangered species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of control options
- If prevention efforts (lethal and non-lethal techniques) fail to stop damage, what other strategies can be implemented.

Under the current program, WS-California receives requests for assistance from and may enter into cooperative agreements with private landowners, livestock managers, Native American Indian tribal land managers, cooperating counties, Bureau of Land Management, U.S. Forest Service, California Department of Fish and Wildlife (CDFW), California Department of Water Resources, California Department of Food and Agriculture, and other federal, state, county, and municipal agencies. The methods used in the current program include providing technical assistance and direct control for methods including ground shooting, aerial operations, snares, live-capture traps, trained dogs, quick-kill traps, gas cartridges, fladry/turbo fladry, and increased human presence. Most IWDM methods have recognized strengths and weaknesses relative to each specific predator damage situation.

WS-California personnel can determine for each IWDM activity what method or combination of methods is most appropriate and effective using the APHIS-WS decision model (Slate et al. 1992, entire). WS-California conducts direct control activities on lands where signed Work Initiation Documents for Wildlife Damage Management (formerly called Agreements for Control on Private/Non-private Property) have been executed. In some cases, with public land agencies, a Memorandum of Understanding serves as these Work Initiation Documents for control activities.

2.2 Types of Management Assistance

Technical Assistance Recommendations

Under technical assistance, WS-California personnel provide information, demonstrations, and advice on many of the available IWDM techniques. Technical assistance includes demonstrations on the proper use of management devices and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Deciding which recommendations to suggest to a requestor may require substantial effort by WS-California. Part of the decision-making process includes an on-site visit or verbal consultation with the requestor. Generally, several short and long-term management strategies are described. Because the requestor is primarily responsible for implementing these strategies, the recommendations are based on the abilities of the requestor, the level of risk, need, and practical application.

Operational Assistance

Operational assistance is implemented when the problem cannot effectively be resolved through technical assistance and when Cooperative Agreements provide for WS-California operational assistance. The initial investigation defines the nature and history of the problem, extent of damage, and the species responsible for the damage. Operational assistance is conducted or supervised by WS-California personnel as their professional skills are often required to effectively resolve problems. This is especially true when the problem is too complex and requires the direct supervision of a wildlife professional. WS-California considers the biology and behavior of the damaging species and other factors using the Wildlife Services Decision Model (Slate et al. 1992, entire). The recommended strategy(s) may include any combination of proactive and reactive actions that could be implemented by the requestor, WS-California, or other agencies, as appropriate. Reactive management, in response to a loss with the intent of abating or reducing further losses, is most often used. Proactive management, applied prior to damage occurring in areas of historical chronic damage problems, is used less frequently.

2.3 Types of Management Actions with the Potential to Affect the Gray Wolf

Wildlife, including gray wolves, may be the focus of IWDM actions. The IWDM actions that focus on wolves include use of non-lethal techniques such as fladry/turbo fladry, range riding, and site presence. These methods are implemented to protect livestock from wolves, are temporary, and are limited to specific locations (see below for more detail). The IWDM methods that focus on other wildlife may be conducted in proximity to wolves. Some of these actions are lethal; however, as described below, minimization measures will be used to reduce or avoid potential effects to wolves.

2.4 Methods/Devices used in IWDM with the Potential to Affect the Gray Wolf

Non-lethal and preventative methods are prioritized for IWDM when appropriate and practicable. As described above, these are discussed during the technical assistance process and may involve modifications to animal husbandry, habitat, or animal behavior. If these methods do not work or are otherwise deemed ineffective, lethal methods as described below may be implemented. Some of these methods, described below, can also be used non-lethally to restrain an animal; however, it is against California State law to relocate wild mammals (14 CCR § 465.5(g) (1)). Further, translocation of wild animals is discouraged by APHIS-WS Directive 2.501 (USDA 2003, entire) and relocation of problem animals is opposed by various organizations due to the risk of disease transmission (e.g., National Association of State Public Health Veterinarians, Council of State and Territorial Epidemiologists, and the American Veterinary Medical Association). However, in rare instances, CDFW or the Service may request relocation of an animal by WS-California. WS-California follows state laws and regulations regarding the setting and checking of traps and snares per APHIS-WS Directives 2.210 and 2.450 (USDA 2009, entire; USDA 2014, entire).

Ground Shooting

WS-California personnel may either provide advice regarding ground shooting for predators as part of technical assistance or provide the service themselves. Ground shooting with firearms is highly selective for target species and/or the offending individuals. The advantage of this IWDM method is that it can be directed at specific damage situations. The majority of shooting occurs in rural areas on both private and public lands, as well as airports for health and human safety. Shooting is sometimes used as one of the first lethal damage management options because it offers the potential of resolving a problem quickly and selectively. Shooting is limited to locations where it is legal and safe to discharge a weapon.

Calling and shooting is a technique which uses electronic or manual devices that broadcast recorded or artificial wildlife sounds in the immediate area. This is intended to draw specific species to an area where they can be lethally removed with a firearm. For example, coyotes (*Canis latrans*) and red foxes (*Vulpes vulpes*) that may be difficult to trap, are often responsive to simulated predator calling. Animals react differently to these calls, so their use depends on the species and problem. Calls are often played for short bursts and cause minimal disturbance.

To increase ground shooting efficiency and selectiveness, decoy dogs, predator calling, stalking, and/or baiting may be used. Spotlights, night vision, Forward Looking Infrared devices, and thermal imagery may also be used for night shooting. Spotlights are often covered with a red lens which nocturnal animals may not be able to see, making it easier to locate them undisturbed. Night shooting may be conducted in sensitive areas that have high public use or other activity during the day, which would make daytime shooting unsafe. In addition to these tools, WS-California employees undergo training to properly identify coyotes and juvenile wolves in low ambient light conditions.

To ensure safe use and awareness, WS-California employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training prior to using a firearm in the performance of their job and a refresher course annually thereafter (APHIS-WS Directive 2.615, USDA 2016, entire). Similarly, they are authorized to store, transport, carry, and use only the firearms necessary to perform official APHIS-WS duties. WS-California complies with state laws, statutes, and CDFW authorized methods for ground shooting. The CDFW, commercial operators, and landowners/resource owners that use ground shooting for IWDM, should do so in compliance with state laws and regulations. Please refer to USDA 2020 (p. 11) for more detail.

Aerial Operations

Aircraft, both fixed-wing and rotary-wing (helicopters) are used by WS-California to remove coyotes. The aircrafts most frequently used for aerial shooting and harassment are the fixed-wing aircraft Piper PA-18 Super Cub, Cub Crafters CC-18 Top Cub, and rotary-wing Hughes MD500. WS-California conducts aerial activities on areas only under signed agreement or federal Annual Work Plans, and concentrates efforts to specific areas during certain times of the year. During technical assistance, WS-California may advise cooperators to hire private operators with a CDFW permit for aerial shooting of coyotes. Additionally, WS-California may conduct the work operationally at the request of cooperators.

Aerial shooting consists of visually sighting target animals in the problem area and shooting them with a firearm from an aircraft. Aerial shooting is species-specific and can be used for immediate damage relief, providing that weather, topography, and ground cover conditions are favorable. Aerial shooting can be effective in removing offending animals that have become trap-shy or are not susceptible to calling and shooting or other methods. This method may also be used proactively to reduce local coyote predations in lambing and calving areas with a history of predation.

Fixed-wing aircraft are useful for aerial shooting over flat and gently rolling terrain. Because of their maneuverability, helicopters have greater utility and are safer over timbered areas or broken land where animals are more difficult to spot. Aerial shooting typically occurs in remote areas with low densities of tree or vegetation cover, where the aerial visibility of target animals is greatest. WS-California spends relatively little time flying and shooting over any one area.

The APHIS-WS directives, policy, and other applicable federal, state, or local laws and regulations are followed to help ensure that aerial shooting is conducted in a safe and environmentally sound manner, in accordance with federal and state laws (USDA 2009, entire; USDA 2020, p. 16). State Directors and District Supervisors are responsible for the supervision, management, and compliance for all aviation activities within the state, and all aircraft used by WS-California activities through contract, agreement, or volunteer, shall have been approved by the office of the APHIS-WS National Aviation Coordinator. Additional information on aviation training and certification can be found in USDA 2020 (p. 16).

Snares

Depending on how and where snares are set, they can be used for live-capture and release, holding for subsequent euthanasia, or for a direct kill. Snares are made of strong, lightweight cable, wire, or monofilament line with a locking device, that capture animals by the neck, body, or foot. Snares can be used effectively on animal travel corridors, such as under fences or trails through vegetation. Snares offer several advantages over foothold traps (described below) because they are lighter to transport or carry and not as affected by inclement weather.

When an animal steps into the cable loop placed horizontally on the ground, a spring is triggered, and the cable tightens around the foot to hold the animal. If the snare is placed vertically, the animal walks into the snare and the neck or body is captured or entangled. On standard cable snares, snare locks are typically used to prevent the loop from opening again once the loop has closed around an animal. Loop stops can also be incorporated to prevent the loop from either opening or closing beyond a minimum or maximum loop circumference, which effectively excludes non-target animals or allows for live-capture of target animals.

Most snares are also equipped with a swivel to minimize injuries to the captured animal and reduce twisting and breakage of the snare cable. Breakaway devices can also be incorporated into snares, allowing the loop to break open and release the animal when a specific amount of force is applied. These devices can improve the selectivity of cable restraints to reduce capture of non-target species.

The Collarum™ is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes and foxes. The trigger is designed specifically for canines, which use a distinct pulling motion to set off the device. The device uses an attractant and is activated when an animal bites and pulls a cap. The snare is then projected from the ground up and over the head of the coyote or fox. A stop on the device limits loop closure. As with other types of snares, the use of the Collarum™ device to capture coyotes or foxes is greatly dependent upon finding a location where they frequently travel.

Live Capture Traps
Live capture traps include cage traps, padded-jaw foothold traps, and culvert traps. Bait or lures are used to attract the target animal and encourage it to enter the trap. Once triggered, the trap closes and the animal is contained until it is subsequently released or euthanized. If a non-target animal is captured it can be released. In addition, the California Code of Regulations (Title 14 §465.5 (g) (2) requires that all traps will be checked at least once per day; any trapped animals must be removed each time traps are checked (CDFW 2020a, p. 13).

Cage Trap
Cage traps vary in size and shape and are used by WS-California to capture animals such as coyotes, foxes, feral dogs (*Canis familiaris*), feral swine (*Sus scrofa*), mountain lions (*Puma concolor*), and bobcats (*Lynx rufus*). Depending upon the target animal, cage traps are constructed with welded wire or livestock panels made of galvanized welded rods. Cage traps have a treadle type trigger system and close with a spring or a gravity door; the specifics vary based on the type of animal it is designed to catch.

Selectivity for targets animals is achieved by using appropriately sized traps, bait attractive to the target species, and placement near signs of damage or near known travel areas. Cage traps are set by WS-California personnel and are checked daily by WS-California personnel, landowner/manager, or a designated agent.

Cage traps are most commonly used near homes and outbuildings in urban/suburban areas, but can also be used in rural locations. Because animals are held alive, non-target animals are released; target animals are euthanized, released on site (e.g., for disease surveillance or population monitoring), or relocated, if approved.

Padded-jaw Foot-hold Traps
Per California Fish and Game Code, it is illegal for any person to use body-gripping traps (e.g., padded-jaw foot-hold traps), except in the case when this is the only method available to protect human health or safety (CDFW 2020a, pp. 1, 12) and to protect threatened and endangered species (National Audubon Society v. Davis, 144F Supp. 2d 1160, November 30, 2000).

Padded-jaw foot-hold traps can be used for live-capture and release or hold for subsequent euthanasia. They are made of steel with springs that close the jaws of the trap around the foot of the target species. Padded-jaw foot-hold traps are equipped with a pan tension device that is set to trigger the trap based on the weight of the targeted species, excluding smaller non-target species. These traps may have offset steel or padded jaws, which hold the animal while reducing the risk of injury. These traps usually permit the release of non-target animals unharmed.

Traps are placed in the travel paths of target animals and some are baited or scented, using an olfactory attractant, such as the species' preferred food, urine, or musk/gland oils. Use of baits also facilitates prompt capture of target animals by increasing the chances that the target animal will be attracted to the trap, thereby lowering risks to non-target animals. In some situations a draw station (i.e., a carcass or large piece of meat) is used to attract target animals. In this approach, one or more traps are placed in the vicinity of the draw station. The APHIS-WS Directive 2.450 prohibits placement of traps closer than 30 feet to the draw station to reduce the risk to non-target animals (USDA 2014, entire).

The traps can be staked to the ground securely, attached to a solid structure (such as a tree trunk or heavy fence post), or used with a drag that becomes entangled in brush to prevent trapped animals from escaping with the trap on its foot. Anchoring systems should provide enough resistance that a larger animal that is unintentionally captured should be able to either pull free from the trap or be held to prevent escaping with the trap on its foot.

The level of trap success is often determined by the training, skill, and experience of the user to adapt the trap's use for specific conditions and species. To minimize risk of capturing non-target animals, the user must be experienced and consider the target species' behavior, habitat, environmental conditions, and habits of non-target animals. The pan tension, type of set, and attractant used greatly influences both capture efficiency and risks of catching non-target animals. Therefore, effective trap placement also contributes to trap selectivity. Similarly, when determining how often to check traps, the user must balance the need for avoiding unnecessary disturbance of the trap area and humaneness of trapping to the captured animals.

Culvert Trap

Culvert traps have varied trigger systems, gravity doors, solid material construction, and are transported on a wheeled platform or trailer. Culvert traps are often used in urban/suburban locations for black bears (*Ursus americanus*), but can also be used for other species and in rural areas. The size and weight of culvert traps primarily restrict their use to areas near roads; some models can be disassembled and reconstructed for use in remote areas. Baits may include the livestock that was killed by the target animal as well as baits similar to those that attract bears in urban/suburban areas. Culvert traps usually permit the release of non-target animals unharmed.

Use of Trained Dogs

Decoy Dogs

Decoy dogs are sometimes used to lure coyotes within shooting distance. These dogs are kept under control of personnel and are unlikely to interact with wildlife.

Detection Dogs

Detection dogs are used to detect sign (urine, feces, paths) of mountain lions, bears, coyotes, or other animals. They are kept under the control of personnel and are unlikely to interact directly with wildlife.

Trailing Dogs

Trailing dogs are trained to find and follow the scent of mountain lions, feral swine, and black bears. They are trained to ignore scents of non-target species. The dogs are trained to stay with the target animal and handlers track them with GPS collars. WS-California personnel then euthanize or release the animal, depending upon the situation. WS-California personnel also use trailing dogs to assist CDFW with mountain lion collaring and monitoring.

Quick-kill Traps

Quick-kill traps are used to lethally capture various mammal and rodents; they are lethal to both target and non-target animals. Quick-kill traps include body-gripping traps, snap traps for rats (*Rattus spp*.) and mice (*Mus spp*.), and gopher (Family Geomyidae) and mole (Family Talpidae) traps. Body gripping traps are lightweight, with a pair of rectangular wire frames that kill with a quick body blow when triggered. The Conibear®, a type of body gripping trap, is most commonly used and is set in waterways to lethally remove beaver (*Castor canadensis*). When trapping for beaver the traps are set under water in the entrances of beaver lodges, in under water travel corridors, at or near beaver dams, or areas of other beaver activity. When Conibear® traps are used for nutria (*Myocastor coypus*), river otter (*Lontra canadensis*), or mink (*Neovision vision*), they may be set similar to beaver and muskrats (*Ondatra zibethicus*). These traps can be used in rural and urban areas. The way the trap is set, generally precludes capture of non-target animals.

Body gripping traps with a small jaw spread (less than 6 inches) can be use in trees and buildings for a variety of animals, such as ground squirrels (Family Sciuridae). These smaller traps may also be set in the entrance of a wooden box or other structure containing bait; the trap is trigger when the animal attempts to access the bait.

The use of body gripping traps with a jaw spread exceeding 8 inches is prohibited on land by APHIS-WS directive 2.450. Similarly, California Fish and Game Code (§4004(e)) and 14 CCR §465.5(g) restrict use and placement of some Conibear® traps (see USDA 2020, pp. 14-15). The WS-California personnel follow these directives and regulations.

Gas Cartridges

Gas cartridge application is part of a process called "denning." Denning is the practice of locating coyote, red fox, and striped skunk (*Mephitis mephitis*) dens and killing the young and/or adults by using a registered gas fumigant cartridge. This method used to manage present depredation of livestock by coyotes, fox, and skunks, or anticipated depredation from coyotes. When the adults are killed (by other methods) and the den site is known, denning is used to euthanize the pups and prevent their starvation. Denning is highly selective for the target species responsible for damage. Den hunting for coyotes and red foxes is often combined with other damage management activities such as aerial shooting and ground shooting.

Gas cartridges are normally applied in rural settings on both private and public lands. Sodium nitrate is the principal active chemical in gas cartridges and is a naturally occurring substance. WS-California conducts pretreatment site surveys to identify signs of den use by non-target species (such as tracks or droppings). When dens are selected for fumigation, the fuse of the gas cartridge is ignited and hand-placed at least three to four feet inside in the active den. When ignited, the cartridge burns in the den, depleting the oxygen and producing large amounts of carbon monoxide, a colorless, odorless, tasteless, poisonous gas. Soil is placed in the den entrance after the cartridge is ignited to form a seal to prevent the carbon monoxide from escaping and oxygen entering.

Use of gas cartridges may pose a risk to non-target animals that may also be found in burrows of target predators. Given the omnivorous nature of target predator diets, non-target rodents, reptiles or amphibians are highly unlikely to occur in a coyote or fox den.

All animals removed by denning are humanely euthanized per APHIS-WS Directives 2.425 and 2.505 (USDA 2011, entire; USDA 2013, entire). The gas cartridges used for denning (EPA Reg. No. 56228-21-ZA, USDA 2019, entire) are registered by WS-California with the California

Department of Pesticide Regulation (CDPR). All pesticides used by WS-California are registered under the Federal Insecticide, Fungicide, and Rodenticide Act and administered by EPA and CDPR. All WS-California personnel who apply restricted-use pesticides are state-certified pesticide applicators and have specific training by WS-California for pesticide application per APHIS-WS Directive 2.465 (USDA 2008, entire).

Fladry/Turbo Fladry

Fladry is a single strand of polyline with flagging attached; turbo fladry is when the polyline is electrified. Fladry and turbo fladry are temporary alterations to habitat. Fladry/turbo fladry acts to deter predators (including wolves) from livestock by creating motion when the flags move with wind and by giving a shock when the animal tests the line. Fladry/turbo fladry is a short-term tool, as wolves may become habituated to its presence. Once livestock are removed or wolf activity decreases, fladry/turbo fladry is removed to avoid habituation. WS-California recommends turbo fladry to landowners as a tool to provide temporary relief from depredations and may be able to assist landowners with its installation.

Site Access/Increased Presence

WS-California uses 4-wheel drive vehicles, all-terrain vehicles, snow machines, aircraft, or hoof stock for transportation when conducting IWDM activities. All site access follows the procedures explained in *California Wildlife Service Program Overview* above.

Increased human presence (e.g., range riding, contained fires at night) may discourage wildlife from using or hunting in a particular location. Currently, WS-California does not use increased human presence, but it may be used in the future to decrease wolf activity around livestock. If used, this would be a temporary activity.

Technical Assistance

WS-California may provide technical assistance to landowners and provide recommended activities for landowners to implement (see *Types of Management Assistance above*). Because they are not implemented by WS-California personnel or under the discretion of WS-California if implemented, they are not included in the consultation. See USDA 2020 (p. 17) for examples of the types of activities that may be recommended.

2.5 Minimization Measures

Minimization measures will be implemented as part of the proposed action to avoid or minimize the effects of IWDM activities to adult or juvenile gray wolves. WS-California specialists use a professional program decision model when developing strategies to address all requests for assistance with wildlife damage (Slate et al. 1992, entire). Consideration is given to a variety of factors including the presence of and potential risk to non-target species including threatened and endangered species. WS-California personnel are specially trained in techniques to recognize and minimize risks to non-target species and threatened and endangered species.

Minimization measures put in place for wolves in a 2012 biological assessment and the resulting 2014 Service letter of concurrence (USDA 2012, entire; (U.S. Fish and Wildlife Service (USFWS) 2014, entire) are currently in place and will continue to be implemented as part of the current proposed action. At the time of the previous consultation, only adult wolves were known in California. Since then, wolves have begun breeding in California and additional measures are needed to avoid or minimize the effects of IWDM measures on juvenile wolves. WS-California will rely on information on wolf presence from CDFW, the Service, and other agencies (see Action Area below) involved with monitoring wolves, to take measures to minimize the possibility of injuring or killing a wolf while conducting predator management operations. The measures below will be used for IWDM in areas that are determined to be "occupied wolf range" and areas of new wolf activity as defined in the *Action Area* section below.

The following are the minimization measures agreed to during the 2012/2014 consultation (USFWS 2014, p. 4), which will continue to be implemented under this biological opinion. Updates are shown in [brackets].

- Confirmation of wolf presence is to be made or corroborated by the Service and/or the CDFW. APHIS-WS personnel will participate in interagency wolf monitoring programs and will keep its specialists apprised of the status of wolves in California and provide them with the locations of confirmed wolf presence.
- With the passage of Proposition 4 in 1998, all steel jawed leg-hold traps were banned for use in the state of California. Therefore, APHIS-WS will not use these types of traps in California, eliminating this threat to the gray wolf.
- When the presence of a wolf is confirmed by the Service or CDFW, APHIS-WS will rely on information on the wolf's location from one or both agencies, or other agencies and tribes as they may be involved with wolf monitoring in order to take measures to preclude injuring or killing a wolf while conducting predator management operations.
- The following measures will be used for the activities that may affect wolves in areas occupied by gray wolves:

    - All #3 Soft-Catch traps, which are used in public safety and for the protection of endangered species (primarily Sierra Nevada bighorn sheep, which occurs outside the current range of the gray wolf) will be staked solidly, so that an adult wolf would be expected to pull free from these traps. If soil conditions are such that there is some question about whether the stake might be pulled out of the ground by an adult wolf, then an extended chain with drag will be attached to the trap.
    - Breakaway neck and foot snares can be used in areas known to be occupied by gray wolves. These types of snares are not expected to injure or harm gray wolves. Non-breakaway neck snares will not be used in areas known to be occupied by gray wolves unless wolves are the target species. While there is no proposal at this time to target wolves, potentially, APHIS-WS may be requested to assist with live or lethal wolf capture for the purposes of fitting radio collars, relocating a wolf, or managing livestock or human safety threats. Wolves would not be targeted without further consultation with the Service. [NOTE: Intentional live or lethal capture of wolves is not an activity covered by this 2020 biological opinion].
    - Conibear® traps and non-breakaway snares set for beaver shall be set underwater in areas known to be occupied by federally protected gray wolves. Gray wolves are not expected to come into contact with these devices because they will be underwater.
    - The Service's Pacific Southwest Regional Office [Interior Region 10] and CDFW shall be notified as soon as possible of the finding of any dead or injured gray

wolf according to the 2012 coordination plan [updated in 2016]. Cause of death, injury, or illness, if known, also shall be conveyed to those offices.

Additional minimization measures, described below, will be implemented by WS-California to further avoid or minimize the effects of the proposed action to gray wolves, including juvenile wolves (USDA 2020, p. 25).

- All traps and snares have the potential to capture or haze juvenile wolves. Therefore, these devices will not be used within 1 mile proximity to any known occupied den sites, rendezvous sites, or areas of recently documented pup activity from June 1 to October 1 each year, unless approved on a case-by-case basis by the Service. These dates are based on the reproductive timeline of wolves (see *Status of the Species* below) below (i.e., when pups start to travel some distance from a den or rendezvous site).
- All dog work has the potential to capture or haze wolves, and therefore will not be used within 1 mile proximity to occupied den sites, rendezvous sites, or areas of recently documented pup activity from June 1 to October 1 each year, unless approved on a case-by-case basis by the Service. These dates are based on the reproductive timeline of wolves (see *Status of the Species* below) and correspond to the timeframe when young wolves would become more mobile (i.e., when pups start to travel some distance from a den or rendezvous site).
- In areas of new gray wolf activity, WS-California will follow all minimization measures identified above and will remain in effect for a 2-week period after new wolf activity is documented. WS-California will resume regular activities in the area if after two weeks of monitoring and three searches of the location with no additional wolf sign or activity is detected.

2.6 Action Area

A project's action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR Part 402). The action area for the proposed action includes "occupied wolf range," based on the Service's 1994 Final Environmental Impact Statement (EIS) for the reintroduction of gray wolves into the Northern Rocky Mountains, and is described in the context of APHIS-WS animal damage control activities (USWFS 1994, pp. 75-76). Occupied wolf range are areas of confirmed presence of resident breeding packs, pairs of gray wolves, or areas consistently used by one or more resident gray wolves over a period of at least one month. Specifically, an area of:

a. 5-mile radius around all locations of gray wolves and wolf sign confirmed as described above (non-radio monitored),
b. 5-mile radius around radio locations of resident gray wolves when <20 radio locations are available (for radio monitored gray wolves only), or
c. 3-mile radius around the convex polygon developed from ≥ 20 radio locations of a pack, pair, or single wolf collected over a period of ≥ 6 months (for radio-monitored gray wolves).

The Service recognizes the need for WS-California to rely on the most current maps and other field-based information for delineation of occupied wolf areas. The accuracy and timeliness of the information is essential to define where the Reasonable and Prudent Measures and Terms and Conditions apply (see these sections below). The CDFW produces a map displaying boundaries of known resident gray wolves. The map, and internal communications between the Service, WS-California, and CDFW, represents the best available science and most up-to-date information of wolf activity at any given time, which expands on the definition of "occupied wolf range" used for the Northern Rocky Mountains. Figure 1 depicts the CDFW's map of approximate area of gray wolf activity in California as of April 2020. This map represents the estimated area of current occupied wolf range, which is likely to change as gray wolves continue to expand into and recolonize California. We expect that as times goes on, additional areas of wolf activity will be identified by CDFW, expanding the current occupied wolf range and the action area.

Therefore, the Service will use the CDFW map, in conjunction with information from CDFW, the Service, and WS-California personnel to represent the most current data in determining occupied wolf range and areas of new wolf activity. The map, along with other information shared (e.g. emails, phone conversations, or other maps depicting locations or areas of interest) between the Service, WS-California, and CDFW within the action area designates where WS-California must adhere to the Minimization Measures, Reasonable and Prudent Measures, and Terms and Conditions of this biological opinion. Also see introductory text in the Reasonable and Prudent Measures section for more clarification on the fluidity of how this information may change rapidly across the landscape.

Approximate Area of Gray Wolf Activity - April 2020

This map displays the approximate boundaries of known resident California wolf territories based on the best data available (e.g., tracks, trail camera images, confirmed sightings, and GPS collar data). The locations of dispersing wolves are not included, as dispersing wolves travel widely, and their movements are unpredictable. This map will be updated quarterly or as warranted by new data.

Figure 1: Approximate area of gray wolf activity in California, April 2020 (CDFW 2020b).

3.0 STATUS OF THE GRAY WOLF

3.1 Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "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 CFR § 402.02).

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates gray wolf range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of gray wolf in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of gray wolf; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on gray wolf; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the gray wolf.

3.2 Species Description

Gray wolves are the largest wild members of the Canidae family (Mech 1974, p. 1). Adult males typically range in size from 43 to 45 kilograms (kg) (95 to 100 pounds (lbs)) and adult females range from 36 to 39 kg (80 to 85 lbs) (Mech 1970, p. 11). Gray wolf length varies from 1.5 to 1.8 meters (5 to 6 feet) in length from nose to tail tip. Most wolves stand 66 to 81 cm (2 to 2.5 feet) tall at the shoulder. Tracks are normally 11 to 14 cm (4 to 5.5 inches) long (Paquet and Carbyn 2003, p. 484).

Gray wolves have long legs in relation to body size, a narrow and deep chest, elbow articulation that turns inward, footpads that turn outward, and digitigrade feet (Mech 1974, p. 2). These specific adaptations make gray wolves highly efficient coursing predators, well suited to running and traveling long distances in search of prey. They also have large skulls and jaws, well suited to catching and feeding on large mammals (Mech 1970, pp. 13-14). Wolves also have keen senses of smell, hearing, and vision, which they use to detect prey and one another.

Pelage color varies in wolves, but they are predominantly gray with long hairs covering the body and relatively short hairs on the muzzle and legs. Long, black guard hairs cover the dorsum, tail, and mane (Paquet and Carbyn 2003, p. 484). Aside from the typical gray coloring, pelage includes variations from white to coal black (Mech 1970, pp. 15-16). Mixed color phases frequently occur within a pack or a litter of pups, although black phases occur more frequently in forested areas than in the tundra (Anderson et al. 2009, pp. 1-2).

3.3 Status and Distribution

Gray wolves have a circumpolar range including North America, Europe, and Asia. Due to deliberate human persecution during European settlement until the mid-20th century, wolves were eliminated from most of their range in the 48 contiguous United States as well as portions of southwestern Canada by the late 1930s (Young and Goldman 1944, p. 414; Mech 1970, pp.

31-34). In western Oregon and Washington, wolves were widely distributed in the Coast Range, Cascade Mountains, and Olympic Peninsula. In California, wolves inhabited the southern Cascades, Klamath Mountains, Sierra Nevada Mountains, Modoc Plateau, and North Coast Range (CDFW 2016b, p. 20). By the 1940s in Washington and Oregon, human activities confined wolves to remote mountainous areas, predominantly in the Cascade Mountains (Johnson and O'Neil 2001, pp. 461-463; Oregon Department of Fish and Wildlife (ODFW) 2019, pp. 2-3) and wolves were believed extirpated in California (CDFW 2016b, p. 22).

In the late 1970s, wolves from Canada started to disperse into northwest Montana. And, as public attitudes toward predators changed, wolves received legal protection with the passage of the ESA in 1973. In 1978, the Service published a rule reclassifying the gray wolf as an endangered population at the taxonomic species level (*C. lupus*) throughout the contiguous United States and Mexico, except for the Minnesota gray wolf population, which was classified as threatened. Wolves successfully recolonized northwest Montana in the 1980s and, by 1993, there were an estimated 87 wolves in that area (Fritts et al. 1997, p. 9).

In 1995 and 1996, after the issuance of an EIS and an extensive public review process, the Greater Yellowstone and Central Idaho Wolf Recovery Areas were established and 66 wolves were reintroduced from southwestern Canada to Yellowstone National Park (31 wolves) and central Idaho (35 wolves) (USFWS et al. 2012, p. 1). The Northern Rocky Mountain wolf population expanded rapidly after the reintroduction effort, and by 2003 the population had met all the recovery goals outlined in both the Northern Rocky Mountain Recovery Plan (USFWS 1987, entire) and the Wolf Reintroduction Final EIS (USFWS 1994, entire).

On April 2, 2009, the Service published a final rule to designate the NRM Distinct Population Segment (NRM DPS) of the gray wolf and to delist this DPS due to recovery (74 FR 15123). The NRM DPS includes all of Idaho, Montana, and Wyoming, the eastern third of Washington and Oregon, and a small part of north central Utah. Although within the NRM DPS, the delisting did not apply to Wyoming, which was found to have inadequate regulatory protections at that time. Additional background information on the NRM gray wolf population, including previous Federal actions, can be found in the April 2, 2009, final rule (74 FR 15123). Congressional action in 2011 directed the Service to reissue the April 2, 2009 delisting rule and deemed that it would not be subject to legal or other challenge. On May 5, 2011, the Service published a final rule that implemented Section 1713 of Public Law 112–10, reinstating our 2009 delisting rule for the NRM DPS (76 FR 25590). Since delisting the NRM DPS, the minimum recovery goal of an equitably distributed wolf population containing at least 300 wolves and 30 breeding pairs in the NRM states of Montana, Idaho, and Wyoming for at least 3 consecutive years (managed to maintain over 150 wolves and 15 breeding pairs in each state) continues to be exceeded.

Also on May 5, 2011, we issued a proposed rule to delist gray wolves in the western Great Lakes (WGL) region, announced a national strategy for classifying wolves, and initiated status reviews for several wolf populations, including gray wolves in the Pacific Northwest (76 FR 26086). On September 10, 2012, we published a final rule to delist the gray wolf in Wyoming and remove the Wyoming wolf population's status as an experimental population (77 FR 55530).

In 2013, the Service proposed delisting of the remaining gray wolves in the coterminous United States and Mexico outside of the delisted NRM and WGL DPSs, and keep Mexican wolf listed as an endangered subspecies (78 FR 35664). On December 19, 2014, following two court orders, the Service reinstated regulatory protections under the ESA for the gray wolf in Wyoming and the WGL on February 20, 2015 (*Defenders of Wildlife v. Salazar,* 12-cv-1833-ABJ (D.D.C.); 80 FR 9218). After additional legal debate, wolves in Wyoming were again delisted in 2017 and remain delisted today (82 FR 20284).

On March 15, 2019, the Service again proposed delisting of the remaining gray wolves in the coterminous United States outside of the delisted NRM DPS, and keeps the Mexican gray wolf listed as an endangered subspecies (84 FR 9648). This rule is not yet finalized.

The Service's 2018 biological report, providing background information to support the 2019 proposed delisting rule, contains the most current estimates of minimum wolf numbers across the United States (USFWS 2018, entire). The population in Michigan, Wisconsin, and Minnesota is approximately 4,400 individuals. The Northern Rocky Mountain population (Montana, Idaho, Wyoming, eastern Oregon and Washington, and north-central Utah) is approximately 1,700 individuals. Wolves have expanded into northern California and western Oregon and western Washington. In central and western Oregon, where gray wolves remain under the protections of the ESA, there are four areas of known wolf activity, one area in northern California, and five areas in western Washington. Lone long-distance dispersing wolves have been reported from the listed states of North Dakota, South Dakota, Utah, Colorado, Nevada, Missouri, Indiana, Illinois, Nebraska, and Kansas. The total number of confirmed records in each of these States, since the early 2000s, ranges from one in Nevada to at least 27 in North Dakota.

3.4 Habitat

Wolves are habitat generalists; however, density and distribution of prey strongly influence wolf presence and density on the landscape (Carbone and Gittleman 2002, p. 2273). Gray wolves occupy a variety of land cover types, provided adequate prey exists (CDFW 2016b, p. 153). Historical wolf distribution included most of the Pacific Northwest except for arid deserts and high elevation montane environments (Young and Goldman 1944, pp. 414-415; Mech 1974, p. 1).

A pack establishes an annual home range or territory and defends it from trespassing wolves. These territories vary widely in size, from 33 to 2,600 square kilometers (km^2) (13 to >1,016 square miles (mi^2)) (Mech and Boitani 2003, pp. 21-22; Fuller et al. 2003, pp. 172-175). In northwestern Montana during 1999, the average territory size for 8 packs was 479 km^2 (185 mi^2), ranging from 62 to 1,590 km^2 (24 to 614 mi^2) (USFWS et al. 2000, p. 2). Territories in the Greater Yellowstone Area were even larger, averaging 891 km^2 (344 mi^2), with a range of 85 to 2,419 km^2 (32.5 to 934 mi^2), for 11 packs (USFWS et al. 2000, p. 6). Central Idaho wolf packs have the largest average territory size with 932 km^2 (360 mi^2), ranging from 365 to 1,821 km^2 (141 to 703 mi^2) for 13 packs (USFWS et al. 2000, p. 11). Territories tend to be smaller at lower latitudes (Mech and Boitani 2003, p. 22; Fuller et al. 2003, pp. 172-175). The large variability in territory size is likely due to differences in pack size; prey size, distribution, and availability; population lags in response to changes in prey abundance; and variation in prey vulnerability (e.g., seasonal age structure in ungulates) (Mech and Boitani 2003, pp. 20-27).

3.5 Diet

Wolves are opportunistic predators, but large ungulates constitute a significant proportion of their diet (Peterson and Ciucci 2003, p. 104). Wolves also readily scavenge carrion and prey upon smaller species such as rabbits (*Sylvilagus* spp.), hares (*Lepus* spp.), beavers, birds, and fish (Peterson and Ciucci 2003, p. 104). Wolf scat collected in Yellowstone National Park in 1998 contained voles (Family Cricetidae), ground squirrels, snowshoe hare (*Lepus americanus*), coyote, bear (*Ursus* spp.), insects, and vegetation (Smith 1998, p.13). Earlier research in northwestern Montana documented ruffed grouse (*Bonasa umbellus*), ravens (*Corvus corax*), striped skunks, porcupines (*Erethizon dorsatum*), and golden eagles (*Aquila chrysaetos*) in wolf scat (Boyd et al. 1994, p. 291). Wolves exhibit substantial seasonal shifts in prey selection, and their diets in the winter months shift mainly to ungulates, which are more vulnerable to predation due to snow accumulation (Huggard 1993, p. 382; Stahler et al. 2006, pp. 1925-1926). Wolves use natural (rivers, streams, topography) and human-created features (roads, trails, pipelines, energy corridors) to travel. Linear features increase travel speeds, subsequently increasing net daily movement, and may facilitate hunting and foraging in winter months by providing a travel surface that reduces landscape resistance and increases search rates (Latham et al. 2011, p. 205; Dickie et al. 2016, p. 259-261).

In the western United States, elk (*Cervus elaphus*) and deer (*Odocoileus* spp.) make up the bulk of the gray wolf diet. The proportion of each species in gray wolf diets appears to be dependent on the relative abundance of elk and deer on the landscape. Wolves will also prey on livestock where their ranges overlap, although the degree to which this occurs is highly variable and influenced by many site-specific factors (Bradley and Pletscher 2005, p. 1263). In some instances, wolves repeatedly target livestock while in other areas, wolves, and livestock co-occur without incident (Bradley and Pletscher 2005, p. 1261-1263; Morehouse and Boyce 2011, p. 443-445). Boneyards, where dead livestock carcasses have been piled over many years, are often frequented by wolves, particularly during winter, and they can draw wolves into close contact with livestock (Morehouse and Boyce 2011, p. 443-445).

3.6 Reproduction and Behavior

Wolves are highly territorial, social animals and group hunters, normally living in packs of 7 or less, but sometimes attaining pack sizes of 20 or more wolves (Mech 1970, pp. 38-40; Mech and Boitani 2003, p. 8, 19). Though pack composition varies, packs typically consist of a family group: a breeding pair, their pups from the current year, offspring from previous years that have not yet dispersed, and occasionally an unrelated wolf (Mech 1970, p. 45; Mech and Boitani 2003, p. 2). Pack social structure plays a significant role in gray wolf reproduction (Mech and Boitani 2003, pp. 2-3). Breeding usually occurs only between the dominant (alpha) male and female pair, although sometimes maturing wolves within a pack will also breed with members of the pack or through liaisons with members of other packs (Mech and Boitani 2003, p. 3). Dominant wolves, generally through aggressive behavior, discourage breeding subordinate members of the pack thus suppressing reproduction in other pack members.

Wolves of both sexes reach sexual maturity between one to three years of age. Once paired with a mate, the breeding pair may produce young annually for up to or longer than a decade. The earliest record of gray wolves breeding in the wild is two years, and in some areas, females do not breed until age four (Fuller et al. 2003, p. 175). Females whelp pups from early April into

May, and litter sizes range from one to eleven pups but generally include five or six pups (Mech 1970, p. 119; Fuller et al. 2003, p. 176). Normally a pack has a single litter annually, but two litters from different females in a single pack have been reported, and in one instance, three litters in a single pack (Fuller et al. 2003, p. 175).

From late April until September, adults hunt and bring food back to the pups effectively centering pack activity at or near the den or rendezvous sites (Paquet and Carbyn 2003, p. 486). Early in this time period, the female is with the pups at the den site; pups may emerge from the den at about three weeks old, but continue to use the den until weaning begins at five to six weeks old (Mech 1974, p. 3; Chapman 1977, p. 45). Short distance movements of about a mile may occur during weaning. When pups are eight to ten weeks old, the den site is abandoned and the pack begins to use rendezvous sites (Chapman 1977, p. 46). Rendezvous sites may be close to the den initially but increase in distance as the pups get older and can travel farther (Chapman 1977, p. 48). These sites are often in meadows or forest openings near the den, but sometimes are several miles away (Paquet and Carbyn 2003, p. 486; Chapman 1977, pp. 36, 41). Pups start to travel and hunt with the pack at twelve weeks old. By late September/October pups travel with the pack full time (Mech 1974, p. 3). The pack hunts throughout its territory until the following spring. Offspring can remain with their parents for as many as four or five years before dispersing (Mech and Boitani 2003, p. 2; Jimenez et al. 2017, pp. 587-590).

Generally, by the age of three years, most wolves disperse from their natal pack to locate social openings in existing packs or find a mate and form a new pack (Mech and Boitani 2003, p. 11; Jimenez et al. 2017, pp. 587-590). Dispersers may become nomadic and cover large areas as lone animals, or they may locate unoccupied habitats and members of the opposite sex to establish their own territorial pack (Mech and Boitani 2003, pp. 11-17). Dispersal distances in North America typically range from 64 to 155 km (40 to 96 mi) although dispersal distances of several hundred miles are occasionally reported (Boyd and Pletscher 1999, pp. 1094, 1100; Mech and Boitani 2003, pp. 11-17; Jimenez et al. 2017, pp. 587-590).

Although infrequent, extreme long-distance dispersal events of greater than 300 km (187 mi) were observed over a dozen times by radio-collared wolves in the Rocky Mountains from 1992 through 2008. One dispersed over 1,090 km (680 mi) with an actual travel distance exceeding 9,650 km (6,000 mi) (USFWS et al. 2009, p. 2). These long-distance dispersals may be more prevalent at the periphery of a population's range where there is unoccupied habitat in some directions. In 2011, a radio-collared wolf (OR-7) from northeastern Oregon dispersed over linear 600 km (346 mi), covering more than 1,700 km (1,062 miles) in total, from its natal area into unoccupied regions of southern Oregon and northern California (ODFW 2012, pp. 3, 5). In summary, short and long distance dispersal movements allow a wolf population to quickly expand and colonize nearby areas or areas separated by a broad swath of unsuitable habitat.

Breeding members can be quickly replaced from either within or outside the pack, and pups can be reared by another pack member should their parents die (Packard 2003, p. 40; Brainerd et al. 2008, pp. 94-95; Borg et al. 2015, pp. 184-185). Wolf packs maintain their territories as long as the breeding pair is not killed. If both members of the breeding pair are killed, the remaining members of the pack may disperse, starve, or remain in the territory until an unrelated dispersing wolf arrives and mates with one of the remaining pack members (Brainerd et al. 2008, pp. 95-96;

Mech and Boitani 2003, p. 2). In wolf populations not exposed to hunting pressure by humans, an estimated third of females fail to breed annually. This is in contrast to populations exposed to human hunting pressure where most females breed (Paquet and Carbyn 2003, p. 485).

Wolves may live as long as thirteen years, but their average lifespan in the wild is five years. Some females as old as 11 years have produced pups (Mech and Boitani 2003, pp. 3-7). Wolves die from a variety of natural causes, including starvation, injuries while hunting prey, disease, and intraspecific conflicts (Fuller et al. 2003, p. 176). Human-caused sources of mortality include control actions in response to livestock depredations, harvest, illegal killing, and vehicle collisions. Because of their high reproductive potential, wolf populations can withstand a high rate of mortality. For example, studies of wolf mortality rates in Alaska and Minnesota suggest that human take of wolves can reach 35 percent annually without permanently reducing a wolf population (Fuller 1989, pp. 24-25; Fuller et al. 2003, pp. 184-185).

3.7 Threats

Human-caused Mortality

Human-caused mortality was the main factor causing the decline of gray wolves at the time of listing (43 FR 9611). An active eradication program is the primary reason wolves were extirpated from their historical range in the United States, due to the threat or reality of attacks on livestock (Cluff and Murray 1994, pp. 494-496). In 1817, the U.S. Congress passed a wolf bounty that covered the Northwest Territories. Bounties on wolves subsequently became the norm for States across the species' range. The eventual protection of the gray wolf under the ESA and state-specific endangered-species statutes prohibited the intentional killing of wolves except under very limited circumstances, such as in defense of human life, for scientific or conservation purposes, or under special regulations intended to reduce wolf depredations of livestock or other domestic animals. The regulation of human-caused wolf mortality is the primary reason wolf numbers have significantly increased, and their range has expanded since the mid-to-late 1970s.

Wolves die from a variety of natural or human causes. Natural mortalities result from conflicts between packs, injuries sustained while hunting prey, old age, disease, or starvation. Human-caused mortality includes legal (including harvest and control actions to resolve conflicts) and illegal killings. Occasionally, wolves are killed accidentally (e.g., hit by vehicles/trains, mistaken for coyotes and shot, caught in traps set for other animals, or subject to accidental capture-related mortality during conservation or research efforts) (Fuller et al. 2003, pp. 176-181; Pletscher et al. 1997, p. 461-464). In a few circumstances, individuals who killed wolves stated that they believed their physical safety was being threatened. Many wolf killings, however, are intentional, illegal, and never reported to authorities, making the number difficult to estimate.

The following is summary of the effects of increased human-caused mortality on population growth rates in the northern Rocky Mountains States of Idaho, Montana, and Wyoming as included in the Service’s 2019 proposed rule to delist gray wolves in the lower 48 United States (84 FR 9661). “From 1995 to 2008, wolf populations increased an average of 23 percent annually (range: 9 percent to 50 percent; USFWS et al. 2016, table 6b), while from 1999 to 2008, human-caused mortality removed an average of approximately 12 percent of the minimum estimated population each year (range: 7 percent to 16 percent; see USFWS et al. 2000–2009). Between 2009 and 2015, some or all of the northern Rocky Mountains States (dependent upon the Federal status of wolves) instituted fair-chase wolf hunting seasons with the objective of slowing or reversing population growth while continuing to maintain wolf populations well above federal recovery requirements in their respective States. During those years when legal harvest occurred, human-caused mortality increased to an average of 29 percent of the minimum estimated population (range: 23 percent to 36 percent; see USFWS et al. 2010, 2012–2016), while the annual growth rate declined to an average of approximately 1 percent annually (range: negative 7 percent to 4 percent; see USFWS et al. 2010, 2012–2016). Where harvest occurs, the species' high levels of reproduction and immigration can compensate for mortality rates of 17 percent to 48 percent (USFWS 2018, p. 6). Thus, although 2009 to 2015 is a relatively short time period from which to draw inferences, the population trends observed in the Northern Rocky Mountains suggest that the northern Rocky Mountains wolf population may be able to sustain an approximate 30 percent annual human-caused mortality rate while continuing to maintain a stable to slightly increasing population…" California has committed to conserving wolves as demonstrated by development of management plans, laws, and regulations that protect wolves and regulate human-caused mortality.

Habitat and Prey Availability

Gray wolves are habitat generalists and once occupied or traversed most of the United States, with the exception of the southeast (Nowak 2002, entire). However, a significant amount of gray wolf historical range in the contiguous United States was modified due to human use (Jimenez et al. 2017, p. 582). While lone wolves can travel through, or temporarily live almost anywhere, large portions of gray wolf historical range no longer contain habitat suitable to support wolf packs (Jimenez et al. 2017, p. 582; Mladenoff et al. 1995, pp. 289-292). Suitable habitat primarily consists of forested terrain containing adequate ungulate populations (elk, white-tailed deer, and mule deer) to support a wolf population. Suitable habitat also generally includes areas with minimal roads and human development, as human access to areas inhabited by wolves can result in wolf mortality.

Native ungulate populations are an important factor in maintaining wolf populations. Primary ungulate prey within the range of the gray wolf includes deer and elk. Each state within wolf-occupied range manages its wild ungulate populations to maintain sustainable populations for harvest by hunters. States employ an adaptive-management approach that adjusts hunter harvest in response to changes in big-game population numbers and trends when necessary, and predation is one of many factors considered when setting seasons.

Disease and Parasites

A wide range of diseases and parasites infect the gray wolf, (Brand et al. 1995, entire; Fuller et al. 2003, pp. 176, 180). Although some diseases may be destructive to individuals, most of them seldom have long-term, population-level effects (Brand et al. 1995, pp. 428-429; Fuller et al. 2003, pp. 176, 180, 190-191).

Canine parvovirus (CPV) infects wolves, domestic dogs (*Canis familiaris*), foxes (*Vulpes* spp.), coyotes, skunks, and raccoons (*Procyon lotor*). Exposure may be universal, as CPV has been detected in nearly every wolf population in North America including Alaska (Brand et al. 1995,

p. 421; Johnson et al. 1994, entire). Virtually 100 percent of the wolves handled in Montana, Yellowstone National Park, Minnesota, and Oregon had blood antibodies indicating nonlethal exposure to CPV (Almberg et al. 2009, entire; Smith and Almberg 2007, p. 18; Mech and Goyal 1993, entire). Mech et al. (2008, entire) concluded that CPV reduced pup survival, subsequent dispersal, and the overall rate of population growth in Minnesota. However, around 1979, CPV became endemic in the population and the population subsequently developed immunity (Mech and Goyal 1993, entire). CPV is known to occur in California, but has not been documented in wolves there (CDFW 2016b, pp. 27-28).

Canine distemper virus (CDV) is an acute disease of carnivores and infects canids worldwide (Brand et al. 1995, pp. 420-421). This disease generally infects pups when they are only a few months old, so mortality in wolf populations can be difficult to detect. Serological evidence indicates that exposure to CDV is high among some wolf populations (Carstensen et al. 2017, entire; Smith and Almberg 2007, entire). CDV is known to occur in California, but has not been documented in wolves there (CDFW 2016b, p. 26).

Mange has been detected in wolves throughout North America (Brand et al. 1995, entire; Jimenez 2010a, pp. 1120-1121). Mange mites (*Sarcoptes scabeii*) infest the skin of the host, causing irritation due to feeding and burrowing activities. The intense itching triggers the infected animal to scratch excessively, resulting in substantial hair loss. Mortality may occur due to exposure, primarily in cold weather, due to emaciation or secondary infections (Brand et al 1995, p. 428; Smith and Almberg 2007 p.19; Almberg et al. 2015, p. 3). Mange mites spread from an infected individual through direct contact with others or transmission through use of common areas. Mange may temporarily affect population growth in some areas, but not others (Jimenez et al. 2010a, pp. 1122-1123). In Montana and Wyoming, proportions of packs with mange fluctuated between 3 and 24 percent annually from 2003 to 2008 (Jimenez et al. 2010a, pp. 1121-1123; Almberg et al. 2012, pp. 2844-2850). In packs with severe infestations, pup survival appears low, and some adults die (Jimenez et al. 2010a, pp. 1122-1123). Mange is known to occur in California, but has not been documented in wolves there (CDFW 2016b, p. 33).

Dog-biting lice (*Trichodectes canis*) commonly feed on domestic dogs, but can infest coyotes and wolves (Schwartz et al. 1983, entire; Mech et al. 1985; entire). Lice can reach severe infestation levels, particularly in pups. The worst infestations can result in severe scratching, irritated and raw skin, substantial hair loss, and poor body condition. While there are no confirmed wolf mortalities, death from exposure and/or secondary infection following self-inflicted trauma caused by inflammation and itching may be possible. Dog-biting lice occurred on two wolves in Montana in 2005, on a wolf in southcentral Idaho in early 2006, and in 4 percent of Minnesota wolves in 2003 through 2005, but their infestations were not severe (Jimenez et al. 2010b, entire).

<u>Climate Change</u>
Consistent with Service policy, our analyses under the ESA include consideration of ongoing and projected changes in climate. The term “climate” refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods may also be used (IPCC 2014a, entire). The

term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2014a, entire). Various types of changes in climate can have direct or indirect effects on species and critical habitats. These effects may be positive, neutral, or negative, and they may change over time. The nature of the effect depends on the species' life history, the magnitude and speed of climate change, and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2014b, entire). In our analyses, we use expert judgment to weigh relevant information, including uncertainty, in consideration of various aspects of climate change and its effects on species and their critical habitats. We focus in particular on how climate change affects the capability of species to successfully complete their life cycles, and the capability of critical habitats to support that outcome.

Research on climate change is predominantly theoretical with few empirical studies evaluating how climate change may influence the adaptive capacity of species, including wolves. Applied research data are limited in their scope of interpretation on how climate change may have direct and indirect effects to wolves, from ongoing and potential changes to disease vectors and invasive species. California is already experiencing the impacts of a changing climate. These impacts include but are not limited to warming average temperatures in all seasons, declining summer precipitation, increasing winter precipitation, reduced snowpack, and an increased risk of catastrophic fires (Bedsworth et al. 2018, entire).

Previous research identified possible effects of climate change on wolf populations. Multiple studies highlight altered behavioral responses of wolves in response to increases in snow depth and winter severity. Wolf hunting pack sizes, and subsequently moose predation rates, on Isle Royale increased in relation to increases in winter snow via the North Atlantic Oscillation (Post et al. 1999, entire). Similarly, a study in Banff National Park assessed the North Pacific Oscillation influence on wolf predation of elk in Banff National Park correlated with increasing winter severity and snow depth to increased wolf predation of elk (Hebblewhite 2005, pp. 231-232). Long-term data from Yellowstone National Park suggest that environmental changes that cause variation in phenotypic or genetic characteristics (i.e., frequency of the genotype determinant for black or gray coat varies by forest cover) in wolf populations could result in rapid changes to population size and life history parameters (Coulson et al. 2011, entire). Additionally, anticipated impact of warmer winters is the emergence or arrival of new pathogens or disease vectors (Hofmeister et al. 2012, entire).

Observed effects depend on a multitude of factors other than the degree of climatic change. Gray wolf population size, local plant community composition and their resistance and resilience to climate change, local ungulate communities, and other unknown factors play a substantial role in determining climate change's potential effect on wolves (Latham et al. 2013, pp. 1283-1287; Ellis and Post 2004, pp. 6-7; Mech 2004, pp. 90-92; Post and Forchhammer 2001, pp. 3-5). Gray wolf behavioral responses to extrinsic factors influenced by climate change can have cascading effects and may influence ecosystem function. While research suggests general changes to wolf populations due to climate variability, predicting specific effects to wolf populations is difficult. Gray wolves are habitat generalists and have successfully adapted to a wide range of environmental conditions. Therefore, gray wolves may be more adaptable to these changes than habitat specialist species.

4.0 ENVIRONMENTAL BASELINE

The environmental baseline is the condition of the listed species in the action area, without the consequences to the listed species caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02, as amended August 27, 2019).

The analyses presented in this section supplement the above range-wide *Status of the Species* evaluation by focusing on the current condition of the gray wolf in the action area, the factors responsible for that condition (inclusive of the factors cited above in the regulatory definition of environmental baseline), and the role the action area plays in the survival and recovery of the gray wolf.

4.1 Legal Status of Gray Wolves in California

The legal status of an individual wolf is based on where it is physically located. Currently, gray wolves are federally and state-listed as endangered in California. Hunting of gray wolves is currently prohibited in California.

The CDFW completed a conservation plan for gray wolves in California in 2016 (CDFW 2016a and 2016b, entire). This plan provides a three-phase approach to wolf conservation. Phase I, the current phase, is a period of re-establishment of gray wolves in California, up to a point when there are four breeding pairs for two successive years (CDFW 2016a, pp. 21-23). Phase II is a period of continued expansion of gray wolves into suitable habitat, with population growth driven more by reproduction than immigration from adjacent states (CDFW 2016a, pp. 21-23). Phase III will begin when there are eight breeding pairs for two consecutive years, and may trigger a status review by the State (CDFW 2016a, pp. 21-23). The conservation plan does not specify State delisting criteria as there is much to learn about how wolves will occupy contemporary habitats in California (CDFW 2016a, p. 12).

The California wolf conservation plan used a combination of three habitat models to estimate where wolves may become established (CDFW 2016b, pp. 155-156). Because wolf re-establishment in California is in its early stages, data from the Northern Rocky Mountains was used in the models; as more wolves occupy California, the models and subsequent potential habitat maps will be revised. The modeled habitat includes areas in the southern Cascades, Klamath Mountains, Sierra Nevada Mountains, Modoc Plateau, and North Coast Range.

Elk and deer are the primary prey species of wolves in California (CDFW 2016b, p. 80). Most elk populations are considered to be increasing, although not all historical elk habitat is occupied (CDFW 2016b, p. 82). Deer populations, similar to other places in the west, have declined since the mid-1990s before stabilizing, albeit at lower numbers, in 2011(CDFW 2016b, pp. 87, 89). Where elk and deer overlap, wolves typically select elk (ODFW 2019, pp. 57, 61). Elk and deer in California are managed to provide sustainable populations and meet multiple use objectives including hunting and wildlife observation. Management objectives include information on population trends and are adjusting accordingly to ensure sustainable population levels.

The wolf population in California currently consists of one pack (Lassen Pack) and dispersing wolves (CDFW 2020c, entire). Between January and March 2020, CDFW estimated the Lassen Pack to contain 6 wolves (CDFW 2020d, p. 1). The number of dispersing wolves is difficult to estimate because they do not have established territories and may travel many miles per day in search of other wolves and prey. The CDFW's gray wolf webpage contains an accounting of past and present wolves known from the state (https://wildlife.ca.gov/conservation/mammals/gray-wolf).

The Lassen pack became established in 2017, but the founding members of the pack were first observed in 2015 (CDFW 2020c, p. 1). The pack produced pups in 2017, 2018, 2019, and is suspected of denning in 2020, but has yet to be confirmed. The Lassen Pack occupies portions of Plumas and Lassen counties in northern California. The breeding female was radio-collared in June 2017; one of the pack's 2019 pups was also radio-collared in September 2019. The batteries and/or functionality of both collars have since failed. An additional yearling male was captured and collared in May of 2020. CDFW monitors known locations of the pack based on past use history and telemetry data.

There are no known dispersing wolves at this time; however, it is very difficult to know the whereabouts of uncollared dispersing wolves. Reports of wolf observations are maintained by CDFW; credible reports are investigated. If wolf activity is confirmed, CDFW communicates, as appropriate, with landowners, WS-California, and the Service.

4.2 Factors Affecting Species Environment within the Action Area

Wolves are expected to continue to successfully recolonize suitable habitat in California in the coming years and will be managed following the California wolf conservation plan (CDFW 2016a and 2016b, entire). There are large amounts of public forest lands in the action area that provide suitable habitat for the wild ungulates that wolves pursue. There are also large numbers of domestic livestock in the action area and within the Lassen Pack territory; wolf-caused depredations on livestock have occurred and are anticipated to continue.

Illegal killing of wolves by humans has occurred over the past two years (CDFW 2020c, pp. 1-2). Investigations into the deaths of three wolves (OR-54, OR-59, and an uncollared Lassen Pack yearling) in California are ongoing. However, as is described in the *Status of the Species*, wolves can have very high population growth rates, particularly when they are afforded legal protections and are expanding into unoccupied areas with healthy prey populations (Fuller et al. 2003, p. 183).

5.0 EFFECTS OF THE PROPOSED ACTION

The effects of the action are all consequences to listed species that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02, as amended August 27, 2019). The following effects analysis is based on information provided in the WS-California biological assessment (USDA 2020, entire), as well as our assessment of baseline conditions and expected effects from implementation of the proposed action.

The proposed WS-California activities listed below may affect gray wolves. While "management assistance" may lead to the implementation of the activities below, it is either provided in the form of technical assistance for others (non-WS-California personnel) to implement or is operational assistance in which WS-California may assist with or fully implement IWDM actions. In either case, the actions suggested during management assistance include those below and therefore, the IWDM actions incorporate management assistance by default. Management assistance will not be analyzed as a separate IWDM action for this reason.

To assess the potential effect of these activities we consider the likelihood of wolves encountering these devices within the action area and the likely effectiveness of the proposed measures to minimize harm should they find these devices.

5.1 Ground Shooting
Ground-based shooting targets specific animals. WS-California agents are skilled at identifying their targets and are not expected to inadvertently shoot a wolf (USDA 2020, p. 26). While there is potential that ground shooting could result in death of a gray wolf, it is not reasonably expected to occur because of training and protocols followed by WS-California agents. Therefore, adverse effects to gray wolves from ground shooting are not expected as a result of the proposed action.

5.2 Aerial Operations
Aerial operations target specific animals. WS-California agents are skilled at identifying their targets and are not expected to inadvertently shoot a wolf (USDA 2020, p. 26). While there is potential that aerial operations could result in death of a gray wolf, it is not reasonably expected to occur because of training and protocols followed by WS-California agents. Therefore, adverse effects to gray wolves from aerial operations are not expected as a result of the proposed action.

5.3 Snares
Snares may be placed horizontally to capture a foot, vertically to capture around the neck or body, or may be spring-powered to capture the neck of the target animal. The snare is set in a location determined to be used by the target animal (e.g., trails, tracks, crossings under fences, etc.). The placement of the snare and use of loop stops, swivels, and/or breakaway devices depends upon the animal targeted for capture and provides selectivity so that non-target animals can either escape or be released unharmed. Snares are set and left in place, to be checked regularly.

Neck snares set for predators can be lethal to wolves if they encounter them. The use of breakaway locks is effective at allowing wolves to break free from neck snares without lasting damage when set for animals smaller than wolves. Swivels allow the captured animal to move

around without further tightening the snare. Similarly, loop stops can restrict the closing of the snare such that juvenile wolves, if incidentally captured, could be released.
The use of snares is unpredictable, dependent upon wildlife damage events, thus making it difficult to know how often they will be used in the action area. WS-California has committed to using breakaway neck and foot snares in areas known to be occupied by gray wolves. These types of snares are not expected to injure or harm gray wolves. While gray wolves remain federally listed, the Service will coordinate closely with WS-California and CDFW to relay information for use in identifying occupied wolf range within the action area.

Currently, the potential for wolves to encounter snares deployed in the action area is small but increasing, given that there are few wolves, and that the devices are selectively used in localized areas where other predators have been causing damage. Snares, therefore, are not widespread across the landscape, but as the wolf population grows, the potential for encounters will slowly increase. The proposed minimization measures restrict deployment of non-breakaway neck snares in wolf-occupied areas and prohibit use of all snares within 1 mile of occupied den sites, rendezvous sites, or other areas of pup activity from June 1 to October 1, substantially reducing the potential for adult or juvenile wolves to be killed or injured by these devices. However, given their wide-ranging dispersal capabilities, there will always be a small chance that lone wolves could occasionally encounter these devices outside of known occupied areas and could result in adverse effects. Based on data from the last 15 years in other parts of the gray wolf range with similar programs, we expect snare related incidents to be very rare (Table 1).

5.4 Live Capture Traps
Live capture traps include cage traps, padded-jaw foothold traps, and culvert traps set with an attractant to lure the target animal to enter the trap. Animals are captured alive and subsequently euthanized or released. Padded-jaw foothold traps can be anchored so that trapped animal can either pull free or be held in place so that it cannot escape with a trap on its foot. The type of trap used, bait, trigger sensitivity, and trap placement depends upon the target animal and provides for selectivity to avoid capturing non-target animals. Because these traps are not lethal, non-target animals can escape or be released if captured. Traps are set and left to be checked regularly.

Traps can be customized in several ways to selectively target specific predators. When targeting larger predators such as cougars, pan-tension devices on the trap can be set to exclude smaller species from being captured. Pan-tension devices increase the force required to spring the trap, such that smaller species do not have enough weight or force to trigger the device. When targeting smaller predators, padded-jaw foothold traps with smaller jaws and springs can be used that are not strong enough to hold larger predators such as wolves or cougars. If an adult wolf steps in one of these smaller traps, it can readily pull free of the trap. Younger wolves may not be able to pull free and would remain captured until released.

Traps set for coyotes and other predators typically involve the use of “baited sets”, meaning that they are used with bait consisting of the animal's preferred food or some other lure, such as fetid meat, urine, or musk, to attract the animal. These attractants usually have a very strong odor and thus will also attract the attention of wolves if they pass near the sets. If wolves encounter the traps, they may be captured and subsequently released.

Currently, the potential for wolves to encounter traps deployed in the action area is small but increasing, given that there are few wolves, and that the devices are selectively used in localized areas where other predators have been causing damage. Traps, therefore, are not widespread across the landscape, but as the wolf population grows, the potential for encounters will slowly increase. The proposed minimization measures prohibit use of all traps within 1 mile of occupied den sites, rendezvous sites, or other areas of pup activity from June 1 to October 1, substantially reducing the potential for adult or juvenile wolves to be killed or injured by these devices. In addition, all steel jawed leg-hold traps are banned for use in the state of California; therefore, WS-California will not use these types of traps in California. However, given their wide-ranging dispersal capabilities, there will always be a small chance that lone wolves could occasionally encounter legal trap devices outside of known occupied areas and could result in adverse effects. Based on data from the last 15 years in other parts of the gray wolf range with similar programs, we expect trap related incidents to be very rare (Table 1).

5.5 Use of Trained Dogs

Decoy dogs and detection dogs are under control of their handlers and are unlikely to interact directly with wildlife. Trailing dogs are trained to follow the trail of target animals, while ignoring the scent of non-target animals. The use of trailing dogs has the potential to cause disturbance and change behaviors of wolves also in the area. All trained dogs are tracked by GPS collars. Minimization measures will be implemented such that dogs will not be used within 1 mile of occupied den sites, rendezvous sites, or areas of recently documented pup activity from June 1 to October 1. Therefore, adverse effects to gray wolves from the use of dogs are not expected.

5.6 Quick-kill Traps

Quick-kill traps are lethal to both target and non-target animals. The larger quick-kill traps have the potential to capture and kill adult or juvenile wolves. As with other traps, quick-kill traps are selected based on the target animal and are set in such a way as to minimize the potential for capture of non-target animals. Restrictions on the use and placement of Conibear® traps minimize the potential for capture of non-target animals. In addition, minimization measures will be implemented such that Conibear® traps set for beaver will be set underwater in occupied wolf range. Because the devices will be placed underwater, wolves are not expected to encounter this type of traps. However, given their wide-ranging dispersal capabilities, there will always be a small chance that lone wolves could occasionally encounter legal trap devices outside of known occupied areas and could result in adverse effects. Based on data from the last 15 years in other parts of the gray wolf range with similar programs, we expect trap related incidents to be very rare (Table 1).

5.7 Gas Cartridges

Gas cartridges are hand placed in the active burrow or den of the target animal, the fuse is lighted, and the entrance is tightly sealed with soil. The burning cartridge causes death from a combination of oxygen depletion and carbon monoxide poisoning.

WS-California conducts pretreatment site surveys to identify signs of den use by target and non-target species (such as tracks or droppings). WS-California agents are skilled at determining occupancy by the target species and because of this we do not anticipate gas cartridges to be deployed in an active wolf den. Furthermore, because gas cartridges are to be activated and discharged at the time they are placed, there would not be any risk of wolves being subsequently injured if they come upon the devices at a later time. Therefore, adverse effects to wolves as a result of the use of gas cartridges are not expected.

5.8 Fladry/Turbo Fladry

Fladry and turbo fladry are used to change the behavior of gray wolves by deterring them from entering a livestock pasture. In particular, the fladry/turbo fladry present a visual barrier and an electrical barrier (in the case of turbo fladry). Injury or death to wolves from deployment of fladry/turbo fladry is not expected; therefore, adverse effects to wolves from fladry/turbo fladry are not expected.

5.9 Site Access/Increased Presence

Site access and increased human presence may result in changes to the behavior of gray wolves. In the case of site access, disturbance would be temporary and also would be modified in areas of occupied wolf range such that we would not expect site access to occur in close proximity to a wolf den, rendezvous site, or area of recent pup activity (see minimization measures). Increased human presence in the form of range riding or nighttime activities to discourage wolf use of a particular location would be used to change the behavior of gray wolves. This activity would be temporary and targeted in areas of wolf-livestock conflict. Site access and increased human presence are not expected to result in injury or death to wolves, and therefore, would not result in adverse effects.

5.10 Effects of IWDM Activities in Other States Occupied by Wolves

Activities including those proposed by WS-California are conducted by APHIS-WS in other states within the range of the gray wolf and the Mexican gray wolf (*Canis lupus baileyi*). Incidental captures, injury, and death of wolves have occurred in those states and can provide information on the potential impacts these activities may have on wolves in California. Table 1 provides data on IWDM activities from other states occupied by gray wolves and Mexican gray wolves. This table is included to provide a summary of incidental captures, injury, or death of wolves that resulted from activities that will be implemented under the proposed action and is helpful in determining the potential for effects to wolves in California. In other states occupied by wolves, additional IWDM methods have resulted in death or injury of wolves; however, since those methods will not be used by WS-California they are not included in Table 1. Based on this information, wolves in other states were involved in 7 incidents over a 15-year period from 2005 to 2019, with an average of 0.46 incidents per year. To date, IWDM activities in California have not resulted in incidental capture, injury, or death of wolves. While the table demonstrates that APHIS-WS minimizes the impacts to wolves from IWDM activities (i.e., annual average is low), it also demonstrates that IWDM activities can inadvertently impact wolves. This table will be used to quantify the adverse effects expected from the actions proposed by WS-California in the incidental take statement (see section 8.0 below).

Table 1: The number of gray wolves and Mexican gray wolves unintentionally captured by Wildlife Service in all states from FY 2005 – FY 2019 during routine IWDM activities (adapted from USDA 2020, pp. 26-27).

Fiscal Year	States	Number killed (method)	Number freed (method)	Other (method)	Total
2005	ND	1 (neck snare)	-	-	1
2006	ID	1 (neck snare)	-	-	1
2007	No non-target or unintentional wolves captured by activities also used by WS-California.				
2008	No non-target or unintentional wolves captured by activities also used by WS-California.				
2009	No non-target or unintentional wolves captured by activities also used by WS-California.				
2010	No non-target or unintentional wolves captured by activities also used by WS-California.				
2011	NM	-	-	2 (padded foothold), relocated	2
2012	NM	-	-	1 (padded foothold), relocated	1
2013	NM	1 (firearm)	-	-	1
2014	WY	1 (neck snare)	-	-	1
2015	No non-target or unintentional wolves captured by activities also used by WS-California.				
2016	No non-target or unintentional wolves captured by activities also used by WS-California.				
2017	No non-target or unintentional wolves captured by activities also used by WS-California.				
2018	No non-target or unintentional wolves captured by activities also used by WS-California.				
2019	No non-target or unintentional wolves captured by activities also used by WS-California.				
Total		4	0	3	**7**
Average/year		0.28	0.0	0.20	**0.46**

5.11 Effects on Recovery of the Gray of Wolf

As described in the *Status of the Species*, the gray wolf has been proposed for delisting due to recovery. Threats to gray wolf, primarily from human-caused mortality, have been ameliorated and populations have expanded such that the gray wolf in the lower 48 states has sufficient redundancy, resiliency, and representation to withstand stochastic and catastrophic events, should they occur in the future.

Implementation of the proposed action may result in adverse effects to gray wolves; however, the implementation of minimization measures will reduce the potential risk of adverse effects. Based on data from other states where APHIS-WS implements IWDM activities in occupied wolf range, incidental injury and harm has been low. Those areas have larger wolf populations than California and wolves in those areas are expected to have higher potential encounter rates with APHIS-WS devices. Even so, the rate is very low with only 4 deaths over a 15-year period related to activities that could also occur in California. Wolf populations in the Northern Rocky Mountains have sustained human-caused mortality at much higher levels than this and still exhibit population growth, indicating that wolves are resilient to low-to-moderate levels of human-caused mortality and that population growth is not significantly affected (see *Status of the Species* above). Therefore, the potential for injury or death to wolves in California from implementation of the proposed action (less than one wolf per year) would not be so high as to preclude the continued recovery of gray wolves.

5.12 Summary of Effect to Gray Wolves

Some of the WS-California proposed IWDM activities could adversely affect gray wolves. Activities including ground shooting, aerial operations, use of trained dogs, fladry/turbo fladry, and site access/increased human presence, are not expected to result in adverse effects to gray wolves. However, remotely deployed predator control devices such as snares, live-capture traps, and quick-kill traps could potentially result in injury or death to gray wolves. Based on data from other states where APHIS-WS implements IWDM devices that will be used in California, the rate of potential injury and death area estimated at 0.20 wolves per year and 0.28 wolves per year, respectively (Table 1). These rates of potential adverse effects would not result in impacts to recovery of the gray wolf in the lower 48 states.

6.0 CUMULATIVE EFFECTS

Cumulative effects are defined as those effects of future State, Tribal, or private activities, not involving Federal activities that are reasonably certain to occur within the action area (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

At this time, we are not aware of any other activities in the action area that are reasonably certain to occur that will adversely affect gray wolves. As wolves become more abundant in the area, there will be greater potential for some incidental and accidental trapping or snaring of wolves by private trappers, and some illegal shooting of individual wolves by people who either mistake the animal for a coyote or deliberately target it. However, at this point in time, these actions are not reasonably certain to occur.

7.0 CONCLUSION AND JEOPARDY DETERMINATION

After reviewing the current status of gray wolves, the environmental baseline for the action area, the effects of the proposed activities and minimization measures, and anticipated cumulative effects, it is the Service's biological opinion that the actions as proposed are not likely to jeopardize the continued existence of the gray wolf population. This conclusion is based on the following considerations:

1. In the *Status of the Species*, we describe that gray wolves, outside of the already delisted NRM DPS, are proposed for delisting due to recovery. Threats to the species, primarily from human-caused mortality have been ameliorated such that populations continue to increase in number and expand their geographical distributions. Similarly, populations have expanded such that the gray wolf in the lower 48 states has sufficient redundancy, resiliency, and representation to withstand stochastic and catastrophic events, should they occur in the future.

2. In the *Environmental Baseline* of the action area we explain that gray wolves in California are part of an expanding wolf population, stemming from dispersing wolves from the NRM DPS. The Lassen Pack is the only pack in California at this time; however, dispersing wolves are also occasionally known to occur in the state. The number of wolves in the action area is currently small but is expected to grow in the coming years, particularly as breeding pairs become established. WS-California has been conducting IWDM activities in California with minimization measures for wolves since 2014. Injury or death of gray wolves in California has not occurred from implementation of these actions. With reproduction documented in the Lassen Pack since the completion of the previous section 7 consultation in 2014, there are concerns for additional potential effects to juvenile wolves.

3. The *Effects of the Action* analysis explains that there are potential adverse effects to adult and juvenile gray wolves in the action area from implementation of the proposed action. These activities are generally localized in specific problem areas and not widespread across the landscape. WS-California will continue to implement previously used minimization measures to reduce the potential for injury or death to gray wolves in the action area. Additional minimization measures are included to further minimize the potential for adverse effects to juvenile wolves. Data from other states indicate that the potential for injury or death to gray wolves from implementation of IWDM activities is low. Thus, the combination of few wolves and the relatively limited extent and duration of IWDM activity across a large area is expected to result in limited, if any, overlap between wolves and IWDM devices. Finally, the proposed action will not preclude recovery of the gray wolf.

4. Cumulative effects that could be additive to the proposed action are not expected.

8.0 INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns including breeding, feeding, or sheltering. Harass is defined by the Service as 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 behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of Section 7 (b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of this project is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by WS-California or become binding conditions of any agreement issued to contractors, operators, or permittees, as appropriate, for the exemption in Section 7(o)(2) to apply. WS-California has a continuing duty to regulate the activity covered by this Incidental Take Statement (ITS). If WS- California fails to assume and implement the terms and conditions or fails to require permittees, operators, or authorized contractors to adhere to the terms and conditions outlined in the Incidental Take Statement through enforceable terms that are added to the permit or contract document, the protective coverage of Section 7(o)(2) may lapse. In order to monitor the impact of incidental take, WS-California must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement [50 CFR Section 402.
14(i)(3)].

As noted above in section 2.6, the CDFW approximate wolf activity area map(s), along with other information shared between the Service, WS-California, and CDFW within the action area designates where WS-California must adhere to the Reasonable and Prudent Measures, and Terms and Conditions of this Opinion.

8.1 Amount or Extent of Take Anticipated

With the establishment of a breeding pack of gray wolves in California and the repeated documentation of dispersing wolves in California, the Service determined there is potential for adverse effects (e.g., injury or death) to gray wolves with implementation of the proposed action. Injury or death of gray wolves from implementation of the proposed action, specifically use of snares, live-capture traps, and quick-kill traps, would be considered incidental take. The other proposed activities are not anticipated to result in the incidental take of gray wolves. We recognize that WS-California will continue to conduct IWDM activities at a scope, scale, and magnitude similar to the past, there is a large amount of potential wolf habitat, there is a known breeding pack, and that known wolves with radio collars and unknown wolves without radio collars will continue to disperse and colonize new areas in California. Understanding this, the Service anticipates the following take as a result of implementing the proposed action:

> Over the five-year period covered by this consultation, the implementation of IWDM activities by WS-California in the action area is anticipated to result in the serious injury or death of a total of three gray wolves. The amount of anticipated take is based on injury and harm to gray wolves in other parts of the wolf range, which averaged 0.46 incidents per year (Table 1). Over a five-year period, this would equate to approximately 2.3 wolves, which was rounded up to three wolves for the five year period of this consultation. This take is expected to result from incidental and unexpected wolf encounters with IWDM activities in areas where there is little to no prior knowledge of wolf activity. These encounters will most

likely involve lone wolves that are un-collared and whose whereabouts were not known prior to the incident.

8.2 Effect of the Take

Gray wolves occurring within the action area comprise only a small percentage of the wolf population in the contiguous United States. In California, the wolf population is expected to continue to increase and expand geographically. The Service determined that the anticipated adverse effects, resulting in the potential incidental take of wolves, from the proposed IWDM activities by WS-California is not likely to jeopardize the continued existence of the gray wolf.

8.3 Reasonable and Prudent Measures

Reasonable and Prudent Measures (RPM) are non-discretionary measures designed to minimize impacts on specific individuals or habitats affected by the proposed action and involve only minor changes to the Project. Pursuant to 50 CFR 402.14 (I) (ii), RPMs are those the Service considers necessary to minimize the effects of the incidental taking.

With regard to RPMs (and their implementing Terms and Conditions (TC)), the Service acknowledges that wolf activity, including radio-collar data and sightings, are fluid in nature and may change the location, shape, or presence of occupied wolf range rapidly. Therefore, the Service will use the CDFW map of approximate wolf activity, in conjunction with information from CDFW, the Service, and WS-California personnel to represent the most current data in determining occupied wolf range and areas of new wolf activity. The map, along with other information shared (e.g. emails, phone conversations, or other maps depicting locations or areas of interest) between the Service, WS-California, and CDFW within the action area designates where WS-California must adhere to the Minimization Measures, Reasonable and Prudent Measures, and Terms and Conditions of this biological opinion. The Service understands that information sharing and the location of the application of RPMs and the associated TCs may not happen in sync with the data that is collected and disseminated. The Service will make every attempt to share the most current data with WS-California as it becomes available so that the appropriate measures can be taken by WS-California to minimize incidental take of wolves based on the information that is known at the time when IWDM activities occur.

The Service believes that the following RPMs are necessary and appropriate to minimize take of gray wolves:

RPM 1: When in areas identified as occupied wolf range or areas of new wolf activity, WS-California shall avoid or minimize the amount and extent of take resulting from its predator control activities by implementing the appropriate minimization measures contained in the biological assessment (USDA 2020, pp. 23-25) and included in the *Proposed Action* section of this biological opinion.

RPM 2: When outside of occupied wolf range or areas of new wolf activity, WS-California shall avoid or minimize the amount and extent of take resulting from its predator control activities by actively looking for evidence of wolf activity in the areas where work is proposed to occur and implementing the appropriate conservation measures when evidence of wolves is found.

RPM 3: WS-California shall avoid or minimize the amount and extent of take resulting from its predator control activities by coordinating closely with the Service and CDFW to ensure field personnel have the latest and most reliable information on wolf activity in the action area.

8.4 Terms and Conditions

To be exempt from the prohibitions of Section 9 of the Act, WS-California is responsible for compliance with the following TCs, which implement the RPMs described above. These measures are non-discretionary and must be undertaken by WS-California or made a binding condition of any contract, grant, or permit, as appropriate, in order for the exemption in section 7(o)(2) to apply. WS-California has a continuing duty to regulate the activities covered by this incidental take statement.

To implement RPM 1, WS-California shall ensure that the following TCs are implemented in occupied wolf range and areas of new wolf activity:

TC 1.1: Live-traps, quick-kill traps, and snares shall be checked daily when using any traps (other than Victor #3 Soft Catch traps, Victor 3N traps, or traps with an inside jaw spread less than a Victor 3N) or snares. Traps shall be equipped with a drag in those situations where a stake might not hold a trapped wolf until it could be released and connections shall be welded or otherwise securely fastened and of strength appropriate for a wolf (i.e., so that a wolf may self-release by pulling out of the trap without breaking the chain or connections).

TC 1.2: No live-traps, quick-kill traps, or snares shall be used within 1 mile of occupied den sites, known active rendezvous sites, or areas of recently documented pup activity from June 1 to October 1 unless approved on a case-by-case basis by the Service.

TC 1.3: Snares used in occupied wolf range or areas of new wolf activity will have breakaway devices. Breakaway devices must be designed to allow for loop release and be capable of releasing a wolf of any size unharmed. In addition, neck snares without breakaway devices shall not be used within a 3-mile radius around areas where WS-California, CDFW, or Service wolf monitoring information suggests that wolves may be present. If the devices are already in place, they shall be removed immediately.

TC 1.4: In areas of new wolf activity, the above restrictions will remain in effect for a 2-week period after new wolf activity is documented. After 2 weeks, regular WS-California activities may be resumed if a minimum of three searches are completed and yield no new wolf sign or activity in the area.

To implement RPM 2, WS-California shall ensure that the following TCs are implemented in areas **outside** of occupied wolf range and areas of new wolf activity:

TC 2.1: If WS-California, CDFW, or Service wolf monitoring information suggests that wolves may be present in an area, neck snares without breakaway devices shall not be used within a 3-mile radius of that area. If the devices are already in place, they shall be removed immediately. This restriction will remain in effect for a 2-week period after new wolf activity is documented. After 2 weeks, use of non-breakaway neck snares may be resumed if a minimum of three searches are completed and yield no new wolf sign or activity in the area.

TC 2.2: When WS-California personnel find evidence of recent wolf activity (fresh or old) in an area not identified as occupied wolf range, the activity shall be reported to the Service and CDFW as soon as practicable, and trap checks shall be conducted daily when using traps capable of holding a wolf.

To implement RPM 3, WS-California shall ensure that the following TCs are implemented in the action area:

TC 3.1: WS-California shall maintain regular contact with CDFW and the Service to keep apprised of locations and information on the presence of wolves and to receive up-to-date information on areas considered to be occupied wolf range or areas of new wolf activity.

TC 3.2: WS-California shall notify the Service's Klamath Falls Fish and Wildlife Office as soon as possible when they find evidence, or are told about evidence, of new wolf activity.

TC 3.3: WS-California shall report any type of incidental take of wolves to the Service's Klamath Falls Fish and Wildlife Office immediately when possible and always within 24 hours of the incident.

i. Due to the sensitive and sometimes urgent nature of WS-California work, the Service and WS-California will conduct an after-action review in the event of any incidental take to re-evaluate the incidental take statement and to ensure that the RPMs, along with the TCs and minimization measures, were adequately followed. These after-action reviews may require modification of some aspects of WS-California's proposed action.

TC 3.4: In the event that a live wolf is incidentally captured, WS-California shall coordinate with CDFW and the Service as soon as possible to determine its status and if it should be radio-collared before being released.

TC 3.5: An annual monitoring report, due March 1 of each year, shall be provided to the Service's Klamath Falls Fish and Wildlife Office that summarizes IWDM activities for the previous calendar year in occupied wolf range and areas of new wolf activity, including any actions taken by WS-California to avoid or minimize impacts to gray wolves. This includes any wolf-related incidents (even if no take has occurred).

8.5 Monitoring Requirement

Please see Term and Condition 3.5 for the monitoring requirements of this biological opinion.

8.6 Reporting Requirements

All incidents or possible incidents involving gray wolves associated with WS-California's IWDM activities in the action area should be reported to the Service's Klamath Falls Fish and Wildlife Office as soon as possible.

Disposition of Sick, Injured, or Dead Individuals

Upon locating dead, injured, or sick gray wolves in the action area, initial notification must be made to the Service Law Enforcement Office, located at 2800 Cottage Way, W-2928, Sacramento, CA 95825-1846, at telephone number (916) 414-6660. Instructions for proper handling and disposition of such specimens will be issued by the Division of Law Enforcement. Care must be taken in handling sick or injured wolves to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. In conjunction with the care of sick or injured wolves, or the preservation of biological materials from a dead animal, WS-California has the responsibility to ensure that information relative to the date, time, and location of the wolves when found, and possible cause of injury or death be recorded and provided to the Service.

9.0 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" is defined as suggestions from the Service regarding discretionary measures to (1) minimize or avoid adverse effects of a proposed action on listed species or critical habitat, (2) conduct studies and develop information, and (3) promote the recovery of listed species.

To further conserve gray wolves, the Service makes the following recommendations:

1. Encourage and assist livestock producers in the use of non-lethal depredation prevention techniques in areas where such approaches could be effective.
2. Consider the use of breakaway locks on all snare devices when large predators are not the target animal.

10.0 REINITIATION

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation of consultation with the Service.

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Biological Assessment
for

Semi-aquatic Mammal Damage Management Activities in Coastal California

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ACRONYMS

APHIS	Animal Plant Health Inspection Service
BA	Biological Assessment
CalTrans	California Department of Transportation
CCR	California Code of Regulations
CC	California Coast
CCC	Central California Coast
CCO	California Coast Office
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
CFR	Code of Federal Regulations
CSA	Cooperative Service Agreement
CV	Central Valley
CY	Calendar Year
DPS	Distinct Population Segment
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FGC	Fish and Game Code
FR	Federal Register
IWDM	Integrated Wildlife Damage Management
NC	Northern California
nDPS	Northern Distinct Population Segment
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
PBF	Physical or Biological Features
sDPS	Southern Distinct Population Segment
SCC	Southern California Coast
SONCC	Southern Oregon/Northern California Coast
T&E	Threatened and Endangered
USDA	United States Department of Agriculture
WID	Work Initiation Document
WS	Wildlife Services
WS-California	Wildlife Services-California

EXECUTIVE SUMMARY

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) in California (hereafter WS-California) conducts integrated wildlife damage management (IWDM) to alleviate semi-aquatic mammal damage within the range of Chinook salmon (*Oncorhynchus tshawytscha*), California Coastal (CC) evolutionarily significant unit (ESU) (threatened); Coho salmon (*Oncorhynchus kisutch*), Southern Oregon/Northern California Coast (SONCC) ESU (threatened) and Central California Coast (CCC) ESU (endangered); steelhead (*Oncorhynchus mykiss*), CCC distinct population segment (DPS) (threatened), Northern California (NC) DPS (threatened), Southern California Coast (SCC) DPS (endangered), and South Central California Coast (SCCC) DPS (threatened); green sturgeon (*Acipenser medirostris*), southern DPS (sDPS) (threatened); and eulachon (*Thaleichthys pacificus*) sDPS (threatened). IWDM is conducted to protect property, agriculture, and infrastructure from damage caused primarily by beavers (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and nutria (*Myocastor coypus*). This biological assessment (BA) addresses the possible effects of IWDM for semi-aquatic mammal damage on federally threatened and endangered salmonids, sturgeon, and eulachon within the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), California Coastal office (CCO).

SECTION 1: INTRODUCTION

I. Purpose of the BA

The purpose of this BA is to evaluate the potential effects of WS-California IWDM activities to alleviate damage caused by semi-aquatic mammals, in protection of agriculture, property, natural resources, and human health and safety, on the federally listed species under the Endangered Species Act (ESA) of 1973, as amended. It specifically assesses the impacts of WS-California's IWDM of semi-aquatic mammals on the following species: Chinook salmon, CC ESU (threatened); Coho salmon, SONCC ESU (threatened) and CCC ESU (endangered); steelhead, CCC DPS (threatened), NC DPS (threatened), SCC DPS (endangered), and SCCC DSP (threatened); green sturgeon sDPS (threatened); and eulachon sDPS (threatened).

II. Purpose & Need of the Project

Conflicts between people and wildlife occur when wildlife negatively impact a resource that people value. These conflicts can occur wherever people and wildlife share space. The mission of APHIS-WS is to provide federal leadership and expertise to resolve wildlife conflicts and allow people and wildlife to coexist. Most WS-California activities do not occur in or near water, however, when assistance is requested to resolve conflicts with semi-aquatic mammal species, work in and around aquatic habitats is sometimes necessary.

Semi-aquatic mammal species commonly reported to cause damage in California include beaver, muskrat, and the invasive nutria. During the five-year period from 2015 to 2019, WS-California received 801 requests for assistance resolving conflicts with these three species. This five-year period was chosen because it is the most recent 5-year period prior to the COVID 19 pandemic. Due to restrictions and changes in requests for assistance associated with the pandemic, WS-California feels that take in 2020, 2021, and 2022 is not representative of typical take numbers. Common landscape damage attributed to semi-aquatic species includes burrowing in levees, flooding of residential and agricultural areas, undermining roads/infrastructure, damage to water conveyance structures, girdling trees, destruction of agricultural and ornamental trees, and damage to sensitive wetlands. Landscape changes caused by semi-aquatic mammals may also be associated with threats to human health and safety through proliferation of West Nile Virus and contamination of the public water supply.

III. Project Summary

WS-California proposes to continue conducting an IWDM program in protection of agriculture, property, natural resources, and human health and safety with the goal of reducing/resolving conflicts between semi-aquatic mammals and people in California. The semi-aquatic mammal species to be managed as part of the ongoing proposed actions detailed in this BA are beaver, muskrat, and nutria. The action area of the proposed action is large, and program activities may occur throughout private, federal, state, tribal, county, and municipal lands/properties wherever WS-California assistance is requested in Coastal California.

The California Coast encompasses the California Coast and the Klamath Basin. WS-California recognizes that there is an overlap between ESA-listed anadromous fishes, their habitats, and its IWDM activities in and around California Coast waterways. WS-California does not target any listed species under NMFS jurisdiction, nor does it target any other fish species within the range of the species to be evaluated in this BA but is aware of the important relationship between salmonids and beaver augmented habitat.

SECTION 2: CONSULTATION PROCESS

I. Agency Authorities

WS is authorized by Congress to protect American agriculture and other resources from damage associated with wildlife by providing assistance to agencies, organizations, and individuals in resolving wildlife conflicts. The Act of March 2, 1931 (46 Stat. 1468-69, 7 U.S.C §§ 8351-8352) states: "*The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program….*" The Act of March 2, 1931, as amended (7 U.S.C. § 8351 – Predatory and other wild animals and § 8352 – Authorization of expenditures for the eradication and control of predatory and other wildlife animals), authorizes the Secretary of Agriculture to conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary deems necessary in conducting the program. The Secretary of Agriculture has delegated this authority to Wildlife Services (WS Directive 1.210: Legal Authority). The Act was amended in 1987 (The Act of December 22, 1987 (Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 8353)) to further provide: "*On or after December 22, 1987, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control Activities.*"

II. Consultation History

A. Out of State Related Consultations

2019 WA Biological Opinion Beavers, WCR-2018-9616: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Aquatic Mammal Damage Management program carried out by the Animal and Plant Health Inspection Service, Wildlife Services in Washington State.

2020 06-08 APHIS Semi Aquatic Mammals WCRO-2018-00284: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for USDA Wildlife Service's Semiaquatic Mammal Damage Management Activities in Oregon.

B. WS-California Consultations

There are no prior informal or formal consultations with NOAA-NMFS for semi-aquatic mammal damage management activities conducted by WS-California. However, there is a concurrent formal consultation process being conducted with the California Central Valley Office of NOAA-NMFS for semi-aquatic mammal damage management activities that occur within their area of jurisdiction.

WS-California has conducted several calls with NOAA NMFS regarding this consult since May 2019. Two field trips were also conducted in August 2019 to familiarize NMFS personnel with the WS-California semi-aquatic mammal management program.

SECTION 3: DESCRIPTION OF THE PROPOSED ACTION

I. WS-California Agency Overview

WS-California is not a land management agency nor a regulatory agency responsible for managing wildlife populations. WS-California IWDM is a collection of activities conducted at the request of and in cooperation with other federal, tribal, state, local agencies, private individuals, and associations to protect agriculture, natural resources, property, and human health and safety from threats and damages caused by wildlife. All WS-California actions are in response to requests for assistance from the public or other agencies when dealing with human-wildlife conflicts.

WS-California uses an integrated and adaptive approach to minimize human-wildlife conflicts by providing technical assistance (education, information, and advice), and operational wildlife damage management using a wide variety of strategies and tools. Operational wildlife damage management may be provided on federal, tribal, state, county, municipal, and private lands when assistance is requested and where written authorization is in place. Written authorization may be in the form of memoranda of understanding, cooperative service agreements, or work initiation documents (WID). All management actions are directed toward individual animals and/or localized groups causing damage, and not toward the management of the population. All wildlife damage management is based on interagency relationships, which require close coordination and cooperation because of overlapping authorities and legal requirements.

II. Project Location

Requests for assistance managing wildlife conflicts, including those caused by semi-aquatic mammals, could come from anywhere within the State. As such, WS-California has the potential to respond anywhere in the state where assistance is requested to manage beavers, muskrats, or nutria. This should not be misinterpreted as WS-California working in all areas of the state, but rather that the potential for conflict occurs wherever semi-aquatic mammals and humans share space. WS-California could respond anywhere within the state; however, its actions are limited to those locations where requests for assistance are received, and not applied across the entire area of jurisdiction.

WS-California receives requests for assistance from and may enter into CSAs with private landowners, agricultural producers, Native American Indian tribal land managers, civil entities, and other public land managers. Any removal of semi-aquatic mammals on federal or other public lands is coordinated with the land management agency prior to beginning work. Additionally, before management actions are conducted on private lands or other public lands, WIDs are signed with the landowner or administrator. These documents describe the methods to be used and the species to be managed. Management is directed toward individual animals and/or localized groups causing damage, to reduce the conflict between wildlife and people and not for reducing wildlife populations.

WS office jurisdictions are divided by management areas, as are NOAA-NMFS West Coast Regional Offices. For this consultation we will be addressing semi-aquatic mammal damage and WS-California IWDM activities which may occur in the following counties: Del Norte, Siskiyou, Trinity, Humboldt, Mendocino, Sonoma, Marin, Alameda, San Mateo, Santa Cruz, San Francisco, Santa Clara, San Benito, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, San Bernardino, Orange, Riverside, and San Diego counties. Portions of Modoc, Glenn, Solano, Lake, Napa, and Contra Costa counties are also included into his BA as these counties are divided between NOAA-NMFS field office jurisdictions based on the historical ranges of the fish populations they each manage (Figure 1). There is some overlap in NOAA-NMFS field office jurisdictions in some counties that contain waterways that are used by multiple anadromous populations.

The action area of the project includes all habitats within the CCO jurisdiction where WS-California is likely to respond to semi-aquatic mammal conflicts. These include, but are not limited to, locations in agricultural fields, irrigation canals and ditches, land-locked ponds/lakes, leveed deep water channels, urban/suburban flood control structures, and natural steams/rivers.

III. Project Description

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and control of damage caused by wildlife based on analyses and the informed judgment of trained personnel. The philosophy behind IWDM is to implement effective management techniques in a cost-effective manner while minimizing the adverse effects on humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances and may incorporate cultural practices (i.e., removal of artificial food sources), habitat modification, animal behavior (i.e., scaring or hazing), removing local individuals or groups, or any combination of these, depending on the characteristics of the specific damage problems.

Figure 1. NOAA-NMFS Coastal California jurisdiction.

Consideration is given to the following factors before selecting or recommending control methods and techniques:

- Species responsible for damage
- Magnitude, geographic extent, frequency, and duration of the problem
- Status of target and non-target species, including threatened and endangered (T&E) species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of control options
- What other strategies can be implemented if prevention efforts (lethal and non-lethal techniques) fail to stop damage.

All IWDM methods have recognized strengths and weaknesses relative to each semi-aquatic mammal damage situation which necessitates specific tool selection for each locale where IWDM will be implemented.

IV. WS-California Decision Making

When WS-California receives a request for assistance, trained and experienced employees determine the appropriate IWDM methods to recommend and/or implement by using the APHIS-WS Decision Model (Slate et al. 1992, WS 2014a; hereafter called the "Decision Model"; Figure 2). Upon receiving a request for assistance, an employee uses the Decision Model to assess the problem and evaluate the effectiveness of the various methods available for IWDM. The employee then recommends a strategy based on a variety of factors including short-term and long-term effectiveness of the method; possible restrictions due to laws, regulation, or site-specific conditions; environmental considerations; and cost. The employee presents the options and methods deemed to be practical and effective for the situation to the cooperator. After management methods have been applied, the employee and/or the requestor monitor the effectiveness of the employed method. Based on the employee's evaluation of the monitoring results, management strategies are adjusted, modified, or discontinued as appropriate.

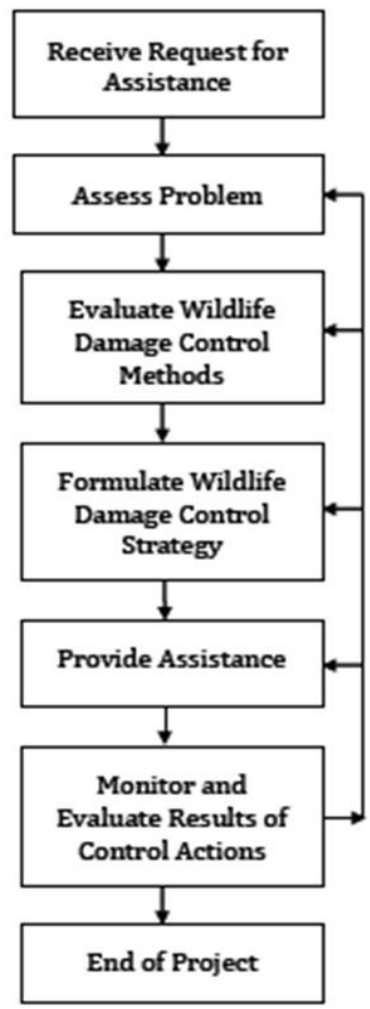

Figure 2. WS Decision Making Model

WS often assists multiple requestors concurrently. In addition, WS-California receives limited funding, as such, requestors are asked and expected to implement methods, when possible, thereby reducing the need for

WS-California’s continued assistance. This allows WS-California’s efforts to be focused on those activities that the requestor is less skilled or equipped to do, such as lethal actions.

V. When Management Actions Occur

A. Proactive Damage Management

Proactive Damage Management is the application of IWDM strategies prior to occurrence of damage based on historical problems, or potential threat of damage. When requested and appropriate, WS-California personnel can provide information, conduct demonstrations, and/or act to prevent these historical problems from recurring. These actions can entail both lethal and nonlethal methods. For example, requestors experiencing damage to trees can fence or obstruct access to individual trees or vulnerable areas. Culverts or other impoundments that have previously been obstructed by beavers can be replaced or designed with a flow device (e.g., pond leveler) to allow for the free flow of water despite being dammed.

Levee systems that divert water to protect human interests and have sustained historical damage from burrowing semi-aquatic rodents, such as beaver or muskrat warrant the proactive removal of injurious individuals or groups. The invasive nutria, known to cause significant damage to manmade floodway and water conveyance structures, as well as natural wetland habitats, is a targeted species for proactive removal pursuant to established eradication programs. Some proactive damage management can take place on most private lands without special authorization. However, the California Department of Fish and Wildlife (CDFW) and the U.S. Army Corp of Engineers should be contacted for certain activities requiring permits or approvals (e.g., lethally removing beavers and removing or adding fill). Additionally, NMFS and/or USFWS may require consultation for federal actions.

B. Reactive Damage Management

Reactive Damage Management is the application of IWDM in response to an incurred loss with the intent of abating or reducing further losses. As requested and appropriate, WS-California personnel provide information, conduct demonstrations, and/or act under a signed WID to prevent additional losses from occurring. For example, WS-California may respond to a request for assistance where a requestor has implemented reasonable measures to prevent or stop damage from occurring but continues to experience damage. WS-California may assist with implementing other non-lethal methods, or may assist by lethally removing an individual animal. These actions may prevent further losses or temporarily alleviate losses and allow time for the requestor to implement more non-lethal methods.

VI. Categories of Management Assistance

A. Technical Assistance

Technical assistance recommendations are the responsibility of the requestor to implement. As part of technical assistance, WS-California personnel provide information, demonstrations, and advice on legally available and effective IWDM techniques. This may include demonstrations on the proper use of management devices (e.g., suitcase traps, cage traps, etc.), information and advice on exclusion, habitat management, and animal behavior modifications. Technical assistance is generally provided by WS-California personnel following an on-site visit or verbal consultation with the requestor. Personnel usually describe several management strategies to the requestor for short- and long-term solutions to damage problems. The strategies recommended are chosen based on the level of risk, the abilities of the requestor, need, and practical application. Technical assistance requires WS-California personnel to mentally go through the Decision Model process and verbally describe the options to the requestor.

Recommendations made during technical assistance are the responsibility of the land/resource owner and are not carried out by WS-California. WS-California provides recommendations in an educational capacity and has no control over if or how its recommendations are implemented. As such, impacts of technical assistance are not included in this BA as WS-California does not physically implement, does not know how provided technical assistance is executed, and does not have any authority to mandate whether these actions occur.

B. Direct Control

When the problem cannot be resolved effectively through technical assistance or through the requestor's own ability, and when provided for with signed agreements, WS-California personnel will assist a cooperator with direct control. During the initial investigation, the WS-California employee defines the nature and history of the problem, extent of damage, the species responsible for the damage, and available options to consider. Professional skills of WS-California personnel are often required to effectively resolve issues when the damage is chronic and/or complex and requires the direct supervision of a wildlife professional. WS-California personnel consider the biology and behavior of the damaging species and other factors using the Decision Model. The recommended strategy may include any combination of proactive and reactive actions that could be implemented by the requestor, WS-California, or other agencies, as appropriate. Direct control is typically either supervised or directly implemented by WS-California personnel.

VII. IWDM Options for Resolving Aquatic Mammal Damage

APHIS-WS Directive 2.101 (USDA 2022) on Selecting Animal Damage Methods directs all APHIS-WS staff to give preference to nonlethal methods when practical and effective. However, there are times when preventative measures fall short of resolving the issue or are otherwise inadvisable due to the location, presence of other wildlife in the immediate area, or potential environmental effects. Additionally, the type of damage sustained may affect the ability to respond with nonlethal methods. Most nonlethal options for beaver management focus on protecting trees or leveling water. There are few nonlethal options available to WS-California for controlling semi-aquatic mammals that burrow into levees. In situations where human health and safety is at risk, such as levee burrowing and road flooding due to beaver activities, WS-California works with other management agencies including the California Department of Water Resources (CDWR), California Department of Transportation (CalTrans), county road departments, and city maintenance yards to alleviate the threat of infrastructure failure as quickly as possible. Time may be of the essence in instances where wildlife endangers human health and safety; moreover, the choice of method may be limited by the speed at which it can be implemented.

A. Exclusion

Exclusion refers to the separation of damage causing wildlife from the resource to be protected and is considered one of the earliest forms of wildlife damage management. When managing semi-aquatic mammals, exclusion is most used for beavers. There are several types of exclusion options for beaver damage management.

- **Barriers** are typically used to prevent access to areas containing infrastructure (including road structures and bridges) and valued property such as gardens, fishponds, trees, orchards, dwellings, and livestock, or poultry pens. Selection of a barrier system depends on the wildlife species being excluded, expected duration of damage, size of the area or facility to be excluded, compatibility of the barrier with other operations (e.g., feeding, cleaning, harvesting, recreational activity, etc.), possible damage from severe weather, and the effect on aesthetics. The barrier system also depends on the resource being protected and its value. Systems can range from relatively simple systems such as metal flashing and hardware cloth to highly complex mesh and grid systems. Barrier systems can initially be very costly to erect and expensive to maintain, but can provide a long-term, highly effective solution to some damage problems.

- **Tree protectors and sheathing** can consist of wrapping hardware cloth, solid metal flashing, or other materials around the trunk of the tree, and are used to protect trees from beavers by physically preventing the semi-aquatic animal from causing damage. Sheathing may be impractical where there are numerous plants to protect and because of this, it is mostly used in urban settings where only a few trees or objects need protection.

- **Abrasive materials** can discourage, reduce, or prevent gnawing behavior of rodents (Nolte et al. 2003). Abrasives produce an unpalatable surface that irritates the teeth and mouth of rodents when they attempt to gnaw or chew on the surface. Flexible materials, such as sandpaper, grinder pads and fine-mesh stainless steel screening can be placed on or over objects (e.g., electrical wiring, plastic piping, fruit trees, etc.) that are susceptible to gnawing rodents. Fine sand can be added and mixed with paint, glue, or other suitable liquid adherents to formulate a paste or heavy mixture that can be brushed-on or applied to a surface to discourage rodent gnawing (Nolte et al. 2003). However, this method has had limited success when applied or painted on tree trunks with the purpose of discouraging beaver damage. Abrasive repellents can be used in both urban and rural settings and are most practical where only a few trees or areas need protection.

B. Damage Prevention through Construction & Design

WS-California, if requested, may provide technical assistance/advice pre-construction to reduce potential issues with wildlife damage. However, WS-California is typically contacted when wildlife damage has occurred to an existing levee, structure, etc. rather than at the beginning of a construction project. If involved with a project from the beginning, WS-California works to identify potential problems that may occur and works with a cooperator to prevent or reduce the risk of wildlife damage. All implementation and environmental compliance is the responsibility of the land owner/manager. WS-California would not participate in any physical construction activities.

- **Levee/Ditch Design** can be adjusted to deter burrowing rodents. While these changes may be difficult to make for existing structures, alterations in design can be adopted for new levees and dikes which minimize the burrowing threat from wildlife. Research conducted by Naiman et al. (1988), Erome (1983), and Schulte (1989) provides that there is an upper limit in the river size/stream gradient where the force of the water will be too strong to allow the construction of a dam or that it would run a great risk of being washed out. This typically involves incorporating an impermeable layer to prevent burrowing. Preemptively designing these structures to impede burrowing can be beneficial since damage can be difficult to manage once initiated.

- **Flow Devices** may help prevent beaver activity from flooding areas. Natural beaver activity can affect the flow of water. When this activity occurs near human development, beavers can cause partial or complete obstruction of water flow resulting in the flooding of resources. Managing water flow is one way to respond to beaver damage. Studies have found that flow devices can be viable and cost effective at reducing the likelihood of reoccurring damage, but their success was dependent on the physical site characteristics, requestor attitudes, ability to invest in the devices, and continued maintenance (Spock 2006, Boyles and Savitzky 2008, Hood et al. 2017). Various flow devices and designs exist for managing water while preserving beavers in place. Designs for flow devices include pond levelers, dam flow devices, beaver baffles, beaver deceivers, and other beaver specific culvert designs.

  When damage is occurring in a location where water management may be an effective resolution of the conflict, WS-California initially recommends that the affected resource owner investigate the use of various water control structures aimed at outsmarting beavers. These devices require purchasing permanent equipment and construction activities and so are the responsibility of the land/resource owner/manager to implement. These methods can also require planning, consultation, and authorization from regulatory agencies. As these structures may require alteration of the waterway and affect other wildlife, WS-California will always recommend that the land/resource owner contact CDFW's Lake and Streambed Alteration program and the U.S. Army Corp of Engineers to evaluate the effects of the project on native wildlife. In addition, the landowner should/may contact NMFS for consultation at this time as well. It is the ultimate responsibility of the requestor to decide if these devices will be used to address their conflict and to meet all the required steps for environmental permitting. As such, WS-California would not be the direct implementer of this action.

C. Managing Debris

Debris management is usually associated with addressing or preventing damage caused by beaver, as muskrat and nutria do not move quantities of debris that cause obstruction of water flow. The land/resource owner is the agent responsible for managing material in waterways.

WS-California personnel will not manage debris except for unplugging culverts to benefit fish passage and removing obstructions from irrigation ditches in agricultural areas. WS-California personnel do not remove debris from the site as part of their service, as such, debris stays in the landscape and may provide ecological benefit after it ceases being part of the obstruction. Categories of debris management activities that could be performed by WS-California are listed below:

- **Clearing Culverts/Water Control Structures of Debris.** Culverts may occasionally accumulate debris and impede fish passage. Clearing debris from blocked culvert may be necessary to restore water flow and allow passage for migrating fish. Cleared debris removed by WS-California personnel typically remains on the site either on the bank or in the waterway.

- **Remove Obstructions from Roadside and Irrigation Ditches.** WS-California personnel may use hand tools to remove material obstructing the flow of water through irrigation ditches. These ditches are unlikely to be or have the potential to be good fish habitat. Obstructions in these types of levees or ditched structures do not have the potential to create ponds or backwaters but prevent the ditch from operating properly. When these systems are unmanaged and obstructed by debris, they may erode into the bank structure and lead to a complete loss of the channel and flow of water.

D. Managing Animals

APHIS-WS Directive 2.101 on Selecting Animal Damage Methods directs all APHIS-WS staff to give preference to nonlethal methods when practical and effective. However, there are times when preventative or exclusionary measures fall short of resolving the issue or are contra-indicated by the location, presence of other wildlife in the immediate area, or potential environmental effects. When these situations arise, direct management of the damaging animal may be the only remaining option available to WS-California personnel to resolve conflict.

- **Notching.** When practicable, WS-California personnel may create a small notch in the dam to start a small amount of water flow from the ponded area. The sound of free-flowing water can attract beavers to the location if present. The breached dam and free flow of water will compel the beavers to repair the breach. This natural behavior enables WS-California to ascertain if the dam is still active and determine how many beavers may be present. The size of the notch will not affect the water level, and only be large enough to ascertain beaver presence and numbers using the site.

- **Capture Methods.** The following traps offer WS-California personnel the ability to live capture semi-aquatic mammals. The traps are checked once daily by WS personnel, the requestor, or their designated agent per CDFW direction (California Fish and Game Code (FGC) § 4152(b)).

    - **Cage Traps** are widely used by WS-California for capturing mammals but are most used for nutria and muskrats when managing semi-aquatic mammals. Cage traps vary in size and shape depending on the species being targeted. The trap size most used for nutria and muskrats measures 12” x 12” x 36”. These traps are made of welded wire or plastic, utilize a treadle type trigger system, and have single or double doors that close by spring or gravity. WS-California uses a species appropriate bait placed at the rear of the trap, behind the treadle to encourage the animal to enter and trigger the trap. Alternatively, personnel place cage traps at known entrances or exits of structures used by the target animals. Baiting is unnecessary in these situations as the only movement path available for the target animal is enclosed by the trap.

- **Suitcase/Clamshell/Hancock Traps** are designed to live capture semi-aquatic mammals. Suitcase traps are constructed of a metal frame hinged with springs and covered with chain-link fence type material. When set, the trap is opened to allow an animal to enter and, when tripped, the metal frame closes like a suitcase around the animal. WS-California sets these types of traps in the shallow water near or on the shoreline or bank to ensure that a captured beaver will always have access to air and is not at risk of drowning.

- **Gravity Catch/Ezee Set Traps** are designed to live capture semi-aquatic mammals. These traps consist of a formed, welded metal frame fitted with heavy-duty 2” x 2” x 12” gauge mesh and an adjustable, one pound, 2-way trip trigger. There is no spring, the trap door closes by gravity once triggered. These traps are most often set on a bank and baited with fresh browse or set at the low point of a dam where water flows over the obstruction.

- **Lethal Removal Methods**

  - **Cable Restraining Devices** (commonly referred to as snares) are used by WS-California to capture a variety of species, including beaver and other semi-aquatic mammals. Snares can be used effectively where a target animal moves through a restricted lane of travel (i.e., “crawls” under fences, trails through vegetation, or “pen” entrances). When an animal moves forward through the cable loop, the noose tightens, and the animal is held. The use of a breakaway locks or stops is encouraged when livestock, deer, or other large animals may be exposed to cable devices to reduce the risk of injury to non-target animals (Wildlife Services 2014b). Cable devices may be used as lethal or live-capture devices depending on how and where they are set; however, cable devices set to capture an animal by the neck are usually lethal unless a stop is used to limit the closure on the cable. Target animals that are to be lethally removed, are euthanized at the capture location.

  - **Firearms** (i.e., pellet, center and rimfire rifles and pistols, and shotguns) are used by trained WS-California personnel to remove wildlife including semi-aquatic mammals. Shooting is frequently used in conjunction with spotlights and night-vision or thermal imaging devices at night. If other factors preclude the use of traps and other equipment, shooting may be the only IWDM option available to resolve a situation. Shooting is only applied in situations where it is authorized and can be exercised safely for both WS-California staff and members of the public. Shooting is virtually 100 percent selective for target animals because the identity of the animal is confirmed before the shot is taken per WS-APHIS directive 2.615 (WS 2016). This method is effective for the removal of beaver, muskrat, and nutria due to their nocturnal behaviors of foraging and resting on riverbanks.

As of July 1, 2015, California state law (AB711) and subsequent regulations promulgated by the California Fish and Game Commission require the use of nonlead ammunition in a phased approach when taking wildlife for recreation or depredation purposes. Effective July 1, 2019, nonlead ammunition is required for the taking of any wildlife for any reason. Only nonlead ammunition is used when taking semi-aquatic mammals for depredation and IWDM purposes. More information on the regulations and phased approach can be found at https://www.wildlife.ca.gov/Hunting/Nonlead-Ammunition.

- **Quick-Kill/Body Gripping Traps** can be used by WS-California to capture various semi-aquatic mammals, including beaver, nutria, and muskrat. These traps come in a variety of styles, however conibears are the most common body-gripping trap used for semi-aquatic mammal management. Body-gripping traps consists of a pair of rectangular wire frames that close when triggered, killing the captured animal with a quick body blow. For semi-aquatic mammal control, WS-California often sets these traps underwater in the entrances of lodges or burrows, in underwater travel corridors, or near a beaver dam or other activity area. Wildlife Services policy prohibits the use of body-gripping traps with a jaw spread exceeding eight inches for land sets (WS 2014b) and California FGC 465.5g(4) ”Placement of Conibear Traps” states that traps of the conibear-type with a jaw opening larger than 8” x 8” may be used only in sets where the trap is wholly or partially submerged in water or is:

  - Within 100 feet of permanent water.
  - Within 100 feet of seasonally flooded marshes, pastures, agricultural lands, or floodways when standing or running water is present.
  - Within the riparian vegetation zone, characterized by, but not limited to, willow, cottonwood, sycamore, salt cedar, cattail, bulrush, and rushes, when found within the area defined in section 463(a) where the take of beaver is permitted.

  Quick-kill traps are lethal to both target and non-target animals, so specific placement is critical to reduce the chances of non-target capture injury or death.

- **Euthanasia Methods** include the use of registered drugs (active ingredient sodium pentobarbital) or gunshot to the brain when the semi-aquatic mammal is captured alive but targeted for lethal removal. These methods are species-specific and approved by the American Veterinary Medical Association (AVMA 2020). Typically, gunshot to the brain is the euthanasia method used. WS-California rarely euthanizes semi-aquatic mammals with registered drugs, however, if they are used, WS-California will remove those carcasses from the environment and properly dispose of them.

- **Relocation** is the transport of an animal from one location to another. In California, CDFW maintains the regulatory authority for any movement of wildlife within the state. Currently, CDFW has not issued any programmatic authorization for the relocation of any semi-aquatic mammals causing damage. However, in June 2023, CDFW issued a new policy regarding beaver depredation as well as developed a new Beaver Restoration Program. An element of these two things is relocation of beavers to improve watershed restoration and ecosystem processes. If authorized, non-lethal live traps, as described above, could be used and the animals made available for relocation.

Although the public often perceives relocation as more humane to beaver compared to lethal methods (Needham and Morzillo 2011; Massei et al. 2010), relocation of animals often causes stress and increased risk of mortality in relocated individuals across species. Relocation can also spread diseases and pathogens. In addition to the stress and pathogen-related mortality risks, relocated beavers may disperse from the release site or may experience high mortality or predations (McKinstry and Anderson 2002, Petro 2013). Beavers released to unfamiliar new sites without established ponds and dens for escape are vulnerable to predation (McKinstry and Anderson 2002, Petro 2013). Finally, the relocated animal may become a nuisance at its new location if the release location has potential for additional animal-human conflict (Massei et al. 2010).

- **Eradication.** WS as an agency values all native wildlife, and it is never the goal of WS or WS-California to eradicate any native species population. Management of invasive species is different in that invasive species are considered inherently damaging to the native environment and therefore multiple natural resource agencies and conservation stewards often desire and work towards their removal. Eradication may be the stated objective when WS is working in a planned response to the removal of a non-native species such as nutria.

VIII. Site Access

Semi-aquatic mammal management often requires personnel to briefly enter the water to set traps, use a boat, and/or walk the shoreline. Prior to conducting IWDM, WS-California must receive a request for assistance and a WID must be signed by the landowner/administrator of the property. WS-California uses many different modes of transportation to access a site including 4-wheel drive vehicles, all-terrain vehicles, or on foot. All site access activities would follow federal, state, and local laws, as well as the terms and conditions set forth in WS MOU with land management agencies.

IX. Resources Protected

WS-California provides services (technical assistance or operational assistance) to protect agriculture, property, human health and safety, and natural resources from damage caused by semi-aquatic mammals. For the five-year period from calendar year (CY) 2015-2019, WS-California removed an average of 30 beaver per year in the CCO jurisdiction. The work was primarily done to protect structures, orchards, and other agriculture. More than half of this work occurs primarily in habitats already modified by humans. Less IWDM work is requested and performed in natural streams and creeks with high restoration potential, as human-beaver conflicts more commonly occur near structures built by people and areas occupied by valued properties.

Very few muskrats and no nutria were taken during the analysis period in the CCO jurisdiction. The muskrats were removed to protect irrigation/drainage ditches.

SECTION 4: ENVIRONMENTAL BASELINE

I. Beaver

A. Population Information

Between the years 1800 and 1850, the major explorations beyond established civilization epicenters in the United States were made, in part, for the purpose of discovering new beaver trapping areas. Most accounts of fur trapping in California begin with the arrival of overland settlers in the 1820s, but there are some accounts of seafaring Russian expeditions as far back as the 1790s. The low point of beaver populations in the United States occurred between 1890 and 1900 (Seton 1937), and by the early 1900s there were an estimated 1,000 beaver left in the State of California. In 1911, the California Division of Fish and Game passed a law to protect the remaining beaver population. In the 1920s, the state wildlife agency translocated over 1,200 beavers to watersheds throughout the state as a way of reintroducing them to extirpated areas. As beaver populations started to climb, landowners began to experience property damage and by the mid-1930s, a landowner's right to depredation due to beaver damage was restored. Depredation take of beaver in California continues today through the established depredation permit process established and conducted by CDFW (CA FGC § 4181).

B. Damage Caused by Beavers

When beavers damage or threaten human resources, a landowner can request a depredation permit from the CDFW to lethally remove beavers. The landowner may then carry out the removal themselves or request WS-California's assistance. Some examples of damage to resources that owners/managers seek to alleviate are:

- Burrowing/excavating activity in levees;
- Flooding of private property/structures/residences;
- Undermining of roadways and infrastructure;
- Plugging of water control structures and other irrigation system components;
- Flooding and erosion of agricultural lands;
- Cutting and gnawing of ornamental, agricultural, and commercial trees and other vegetation; and
- Damage to boats, docks, boat houses, and marinas.

CDWR attributes the catastrophic 2004 Jones Tract levee breach to beaver burrowing. Damage from this breach was estimated at $90 million. In 2009, a levee repair carried out by CDWR in Sutter County required 450 cubic yards of fill to be pumped into a beaver den excavated in the levee. CDWR estimated that the void was approximately the size of a two-story 1100 square foot home. Examples of human health and safety threats resulting from beaver activity include:

- Levee collapse/catastrophic failure and subsequent flooding of commercial and residential properties;
- Creation of stagnant water that harbors vectors for West Nile Virus; and
- Contamination of water sources.

C. Beaver Take in California

The North American beaver is designated as a furbearing species in the state of California (CA FGC § 4000); and is lawfully taken pursuant to three distinct authorities provided by state statutes and associated regulations – 1) recreational hunting (CA FGC § 4009.5 and 14 CCR § 463), 2) depredation (CA FGC § 4180) and 3) official duties carried out by CDFW [i.e. wildlife disease outbreaks (CA FGC § 4011) and public safety (CA FGC § 1001)]. The commercial and recreational trapping of beaver was banned when Assembly Bill 273 was recently signed into law on September 4, 2019 (Wildlife Protection Act of 2019).

WS-California most often removes beaver to assist land/resource owners in alleviating beaver damage under a depredation permit. Landowners/agencies can apply to CDFW for a depredation permit when they sustain beaver damage or there is risk of immediate threat of damage pursuant to CA FGC § 4181 and 14 CCR § 401. CDFW staff then investigates the depredation request and reviews evidence of beaver damage or risk of immediate threats. Because landowners often contact WS-California prior to applying for a depredation permit, WS-California sometimes assists CDFW-led investigations of depredation requests. In some cases, the land/resource owner requests that WS-California conduct the damage management activity and will list WS-California as a sub-permittee. WS-California conducts beaver damage management activities only when requested to do so by a landowner/agency who holds the depredation permit issued by CDFW. WS-California removed an average of 30 beaver per year during the period from 2015 to 2019 in the jurisdiction of the CCO (Table 1).

Table 1. Annual Beaver Lethal Take by County within CCO Jurisdiction by Year CY 2015-2019.

County	2015	2016	2017	2018	2019	5 Year Average
Alameda	0	0	0	0	0	**0**
Contra Costa	5	5	11	13	5	**7.8**
Del Norte	0	0	0	0	0	**0**
Glenn	0	0	0	0	0	**0**
Humboldt	0	0	0	2	0	**0.4**
Lake	2	0	0	0	0	**0.4**
Los Angeles	0	0	0	0	0	**0**
Marin	0	0	0	0	0	**0**
Mendocino	0	0	0	0	0	**0**
Modoc	10	0	0	1	0	**2.2**
Monterey	0	0	5	5	0	**2**
Napa	0	0	0	5	0	**1**
Orange	0	0	0	0	0	**0**

County	2015	2016	2017	2018	2019	5 Year Average
Riverside	0	0	0	0	0	**0**
San Benito	0	0	0	0	0	**0**
San Bernardino	0	0	0	0	0	**0**
San Diego	0	0	0	0	0	**0**
San Francisco	0	0	0	0	0	**0**
San Luis Obispo	0	0	0	0	0	**0**
San Mateo	0	0	0	0	0	**0**
Santa Barbara	0	0	0	0	0	**0**
Santa Clara	0	0	0	0	0	**0**
Santa Cruz	0	0	0	0	0	**0**
Siskiyou	5	2	17	7	0	**6.2**
Solano	12	5	5	17	9	**9.6**
Sonoma	0	0	0	0	0	**0**
Trinity	0	0	0	0	0	**0**
Ventura	0	0	0	0	0	**0**
Coastal Total	**34**	**12**	**38**	**50**	**14**	**29.6**

When applying lethal removal, WS-California targets individuals causing damage at the site. Beaver home range can be dependent on habitat quality and geography; however, several studies have found similar average home rages in beavers. Maenhout (2013) tracked 24 and 22 radio-tagged beaver in Bridge Creek, Oregon, 2011 and 2012. The mean linear home range length was 1.56 +/- 0.71 km, with a core use length of 0.72 km. These were like results from Breck et al. (2001) in northwestern Colorado (2.19 km linear home range and 1.01 km core length) and Havens et al. (2013) in east-central Illinois (1.8 km linear home range and 0.7 km core length). There is variability in home ranges due to geography (a linear canal versus a small pond, for instance).

For the purposes of this consultation, site will be defined in the following ways. In linear habitats such as streams, canals, and drainage ditches, site will be defined as one half km in either direction along the linear habitat from the site of damage. Some beaver damage occurs in non-linear locations such as HOA ponds or at water structures in agricultural fields. In these cases, site is defined as the damage location and a radius of one-half kilometer. If the water body is smaller than that one half kilometer radius the site is defined by the body of water. Other bodies of water that are distinct from each other (i.e., a stream running within one kilometer of a pond but not connected by water) will be considered separate sites.

Precise locations for beaver removals were not formally recorded by WS-California. However, field personnel were asked to recall where they removed beaver between 2013-2017, to the best of their ability. These locations do not represent individual beaver removals as more than one beaver may have been removed at each location. These locations were digitized into a shapefile to assist in identifying where beaver work had been performed. This dataset should not be considered complete as there was personnel turnover, and it is not possible for every field person to recall every beaver removal over a five-year period.

WS-California reviewed the removal locations identified by field staff and estimated 27 removal sites in the jurisdiction of the California Coast Office. WS-California further examined the sites to determine the habitat from which the beaver was removed and whether the removal was in critical habitat or in a stream connected to critical habitat. (No critical habitat shapefile was available for SONCC Coho so all sites within the range of that ESU that were not in isolated bodies of water were counted.) WS-California eliminated removal locations at sites that met the following conditions:

- bodies of water that are not connected to streams, canals, etc. (catch basins, farm ponds, lakes);
- locations where habitat would not be allowed to persist (canals that are part of flood control infrastructure that are cleaned out regularly);
- man altered sites such as culverts and impoundments where T&E fish passage is obstructed and flow paths are unable to form;
- sites where a fisheries biologist has requested beaver damage management to support salmonid habitat or preserve fish passage.

At these types of locations, beaver presence is not expected to immediately enhance salmonid PBFs because of isolation, active habitat management by other entities, or restriction of fish passage issues. Of the 27 sites, we determined that 19 sites were within critical habitat or T&E species range, and/or ESF where beaver activity could affect the PBFs in a positive manner (Table 2). Of the eliminated sites, seven were in isolated irrigation/farm/tailings ponds that had no discernible connection to critical habitat streams and one site did not fall within the range, critical habitat, or EFH of salmonid species. WS-California cannot predict where work may be requested; however, we anticipate similar numbers and types of requests for assistance in the foreseeable future. WS-California may need to conduct removals from no more than 75 sites within the CCO's jurisdiction per year. No more than 50 of these will be located where beaver activity could immediately impact salmon and steelhead PBFs.

Table 2. Number of Beaver Removal Sites by HUC10 CY 2013-2017.

HUC10	# of Sites	# of Potential Enhancement Sites
Little Shasta River	2	1
Butte Creek	1	0
Bogus Creek-Klamath River	1	1
Parks Creek-Shasta River	2	1
Willow Creek	2	1
East Fork Scott River	2	2
French Creek-Scott River	3	2
Big Lagoon-Frontal Pacific Ocean	1	1
Humboldt Bay-Frontal Pacific Ocean	1	1
Bucknell Creek-Eel River	1	1
Napa River	2	2
Carneros Creek-Frontal San Pablo Bay Estuaries	1	1

HUC10	# of Sites	# of Potential Enhancement Sites
Tembladero Slough	1	1
San Antonio River	1	1
Nacimiento River	1	1
Paso Robles Creek-Salinas River	2	1
Santa Margarita Creek-Salinas River	3	1
Total Sites per HUC10	**27**	**19**

Other sources of beaver take in California include fur trapping, depredation activities not carried out by WS-California, and recreational harvest. During a five-year period (2014-2015 season through 2018-2019 season) an average of 16 beavers were commercially harvested each year according to CDFWs Licensed Fur Trappers' and Dealers' Reports (https://www.wildlife.ca.gov/Licensing/Trapping). However, as mentioned previously, recreational, and commercial fur trapping has been banned in California as of September 4, 2019, and therefore will not be part of the environmental baseline going forward. CDFW currently allows for unlimited recreational hunting of beaver in 45 counties during the November 1st through March 31st season; however, CDFW does not require reporting of recreational take, so it is unknown how many beavers are harvested recreationally.

D. How Beaver Affect the Environment

Beavers are well known for their construction capabilities. They create dams and lodges for shelter and protection, largely with woody material from trees that grow along the banks. Where beaver dams spread water over natural habitats, they can create additional habitat for many other animals and plants of California.

Studies suggest that beaver can have positive and negative influences on salmonid and steelhead habitat (Leidholt-Bruner et al. 1992, Collen and Gibson 2001, Talabere 2002, Pollock et al. 2003, Taylor et al. 2010, Kemp et al. 2012, Smith and Mather 2013, Pollock et al. 2014, Majerova et al. 2015, Petro et al. 2015, Bouwes et al. 2016, Malison et al. 2016, Weber et al. 2017). Beaver dams create slow-water habitat used by juvenile coho salmon. This occurs because of dams reducing stream velocities and spreading water over a large area (Leary 2012). During high flows, juvenile coho salmon use areas of slow water, typically where beavers are active, as a velocity refuge (Bustard and Narver 1975b, Tschaplinski and Hartman 1983, Swales and Levings, 1989, Nickelson et al. 1992, Kemp et al. 2012). Beaver dams also reduce the silt loads of water by reducing flow rates, which is a benefit for salmonids which require clean gravel for spawning (Rosell et al. 2005).

Beavers impound water with dams to form ponds, and these can be beneficial to salmonids. In non-tidal North American rivers, beaver ponds provide habitat for more than 80 fish species (Pollock et al. 2003), especially juvenile coho salmon (Bustard and Narver 1975a, Swales and Levings 1989, Leidholt-Bruner et al. 1992, Nickelson et al. 1992, Pollock et al. 2004). Beaver pond attributes favoring fish production include high vegetation cover, high invertebrate prey production, and slow current velocities which allow foraging fish to reduce energy expenditures

(Collen and Gibson 2001, Pollock et al. 2003, Hood, 2012). Enhanced fish growth in beaver ponds because of high invertebrate productivity and elevated water temperatures has been observed for sockeye and coho salmon (Murphy et al. 1989, Swales and Levings 1989). During low water flow, beaver ponds provide fish with refugia (Cook 1940, Knudsen 1962). Beaver ponds benefitted coho salmon during summer flow conditions in Oregon, (Leidholt-Bruner et al. 1992), and sockeye salmon during the summer in Alaskan streams (Murphy et al. 1989).

Beaver ponds represent important winter habitat for coho salmon (Swales et al. 1986, Swales and Levings 1989, Nickelson et al. 1992, Miller and Sadro 2003). Survival of overwintering coho salmon in beaver ponds was approximately double compared to the rest of the river system on Vancouver Island, Canada (Bustard and Narver 1975a). The greatest reduction in coho salmon smolt production capacity in the Stillaguamish River in Washington may have originated from the extensive loss of beaver ponds (Pollock et al. 2004). Beaver ponds can create overwintering habitat for chinook. A significant percentage of Chinook parr overwintering in the Grande Ronde River occupied main stem beaver ponds (Favrot and Jonasson 2020).

In tidal channels in the Skagit Delta in Washington, beaver dams and lodges occur in the tidal shrub zone at densities equal to or greater than non-tidal rivers (Hood 2012). Tidal beaver dams provide valuable fish habitat, particularly for juvenile Chinook salmon (Hood 2012). Low tide beaver pools may benefit fish by providing refuge from predators, providing habitat for invertebrate prey, and reducing premature displacement of fish into the bay (Hood 2012). Positive impacts of beaver on species abundance or productivity have been found for steelhead, Chinook salmon, bull trout (Andonaegui 2000), sockeye salmon (Murphy et al. 1989), and coho salmon (Bustard and Narver 1975a, Murphy et al. 1989, Leidholt-Bruner et al. 1992, Nickelson et al. 1992, Pollock et al. 2004, Lang et al. 2006). However, the most cited negative impacts of beaver were impeded fish movement because of dams, siltation of spawning habitat, changing water temperature, dewatering of downstream areas, uneven distribution of spawning, and low oxygen levels in ponds (Mitchell and Cunjak 2007, Tayler et al. 2010, Kemp et al. 2012, Weber et al 2017).

Under certain conditions, beavers may build a series of dams to support the water necessary for them to survive (Mitchell and Cunjak 2007). Beaver dams may present some obstacles to colonizing fish (coho and sockeye salmon) (Murphy et al. 1989). Water flow conditions, dam characteristics and the size and species of fish are important in determining the degree of difficulty presented by beaver dams to fish passage (Rosell et al. 2005). Pollock et al. (2003) reported that “the general consensus among salmon fisheries managers is that beaver dams can be an obstacle to upstream chum salmon movement”. However, Pollock et al. (2003) also reported that personal observation and other studies such as Bryant (1983) suggested that adults and juveniles of coho, steelhead, and sockeye can cross beaver dams. Not all dams are built with the same material or are the same size. Each dam will have unique characteristics that would enable or hinder juvenile movement downstream and adult movements upstream.

Beaver dams, by reducing flow rates, reduce the silt loads of water and this is a potential benefit for salmonids which require clean gravel for spawning. However, following damming, long stretches of streambed can be covered by silt, and potentially important spawning areas can be damaged (Knudsen 1962).

Beaver activity can increase the area of impounded reaches and thus increasing the time available for water to be heated by solar radiation, and by opening the river to sunlight (Cook 1940). Loss of riparian canopy because of beaver activity can cause stream temperatures to increase and can be detrimental to fish such as trout species (Knudsen, 1962). Temperatures in some coastal Oregon streams exceed level suitable for juvenile salmon (Hoffman and Recht 2013). Some of these ponds may be deep enough to offer some refuge for smolt in deeper areas, but managers must also look for ways to increase shade on these ponds to reduce the effects of rising temperatures (Hoffman and Recht 2013). The slowing of water flow and increase in temperature can have detrimental impacts on salmon smolt.

Malison et al. (2016) compared similar large river plan habitats in Alaska and Russia, with beavers present only on the Alaska river system. The authors found that areas without beaver can be more productive for salmon, as beaver dams created inaccessible pond complexes and some ponds became less productive over time (Malison et al. 2016). Similarly, Majerova et al. (2015) monitored a mountain stream in Utah over a 3-year-period before, during, and after beaver colonization. The authors found an overall warming trend downstream of the new beaver dams, however the dams also created thermal heterogeneity of warmer and cooler areas. Weber et al. (2017) found that an increase in beaver dams led to a temperature regime better suited for steelhead.

Beaver ponds are low in dissolved oxygen (Schlosser and Kallemeyn, 2000). This is because of reduced water flow resulting in poor aeration and the abundance of organic matter with its associated high oxygen demand (Naiman et al. 1988). Low oxygen in redds can cause increased mortality of salmonid embryos (Wickett, 1954; Silver et al. 1963). Pollock et al. (2003) concluded that “no study has ever demonstrated a detrimental population-level effect of dams on salmonids, nor has a study shown that beaver dams are more than a seasonal barrier to fish movement.”

In large waterways where beaver dams cannot be constructed because of the waterway’s width (Suzuki and McComb 1998; Hartman and Tornlov 2006; Swinnen et al. 2019), depth (Swinnen et al. 2019; Hartman and Tornlov 2006), water velocity gradient (Suzuki and McComb 1998), or lack of woody debris, beavers may also construct burrows in the bank of a stream or river. Beavers in these locations do not affect the flow of water because no ponding occurs. While data showing the importance of beaver in coastal rivers where they are unable to create dams is lacking, a recent study found evidence that beaver activity enhances juvenile Coho salmon habitat even where beavers are unable to create channel spanning dams (Parish 2016). Beavers in cemented or otherwise manmade urban/suburban flood control systems cannot create natural ponds through the creation of beaver dams but can restrict water flow to the degree that the obstructions create fish passage issues when culverts and water control boxes become completely plugged.

II. Muskrat

A. Population Information

CDFW considers muskrats to be scattered in occurrences throughout California, but continuously distributed along the Colorado River, in wetlands south of Salton Sea (Imperial Co.), the Sacramento and San Joaquin valleys (Shasta Co. south to Kern Co.), the San Francisco Bay area, and in the northern interior counties (Siskiyou, Modoc, Shasta, and Lassen). Muskrats are abundant in fresh emergent wetland habitat and are considered common to abundant in valley foothill and montane riparian habitats as well as aspen, and lacustrine, riverine, and estuarine habitats. Muskrats also occupy human-made habitats such as roadside and irrigation ditches. No survey data is available for muskrats in California. CDFG (2004) estimated their population after mortality between 78,370 and 391,852. This is considered a conservative estimate (CDFG 2004).

B. Damage caused by Muskrats

Belluomini (1978) assessed muskrat damage in California through questionnaires sent to water service agencies throughout California. Most of the responses reporting muskrat damage were from counties that were highly agricultural. This study did not consider damage incurred by farmers and ranchers. WS-California has been requested to manage muskrat conflicts from burrowing into dikes, manmade dams, irrigation ditches, or impoundments, causing structure failure.

C. Muskrat Take in California

The muskrat is designated as a furbearing species in the state of California (CA FGC § 4000); and is lawfully taken pursuant to three distinct authorities provided by state statutes and associated regulations – 1) recreational hunting (CA FGC § 4009.5 and 14 CCR § 462), 2) depredation (CA FGC § 4180) and 3) official duties carried out by CDFW [i.e. wildlife disease outbreaks (CA FGC § 4011) and public safety (CA FGC § 1001)]. The commercial and recreational trapping of muskrat was banned when Assembly Bill 273 was recently signed into law on September 4, 2019 (CA FGC § 3001.a). As defined in these statutes and regulations, muskrat can be taken for recreational hunting purposes November 16 through March 31 with no bag limit, and for depredation purposes at any time.

WS-California removed an average of 338 muskrat per year in the state of California from 2015 to 2019. Other sources of muskrat take in California include fur trapping, depredation activities not carried out by WS-California, and recreational harvest. During the five-year period (2014-2015 season through 2018-2019 season), an average of 1,508 muskrat were commercially harvested each year according to (CDFW 2022). However, as with beaver, recreational and commercial fur trapping was banned in California on September 4, 2019, and will not be part of the baseline going forward. CDFW does not require reporting of recreational take, it is unknown how many muskrats are harvested recreationally.

D. How Muskrats affect the Environment

Muskrats, unlike beavers, do not cut down large woody debris nor create dams that affect the flow of water. Instead, muskrats create burrows in banks of streams or dike/levee systems and trim smaller aquatic vegetation to take into their burrows. In natural habitat, they have little to no effect on the flow of water but may affect the amount and types of vegetation that grows in and around wetlands. Literature about the relationship between muskrat activities and their effects on salmonid habitat was not found. However, the increase in sedimentation caused by bank erosion and collapse from muskrat burrowing in the Fall River in Northern California may be detrimental to the wild trout fishery and the threatened Shasta crayfish (Engeman and Whisson 2003). There is no known beneficial relationship between salmonids and habitat alterations created by muskrat.

III. Nutria

A. Population Information

Nutria are native to South America; however, there are established populations of nutria on every continent except Antarctica and Australia. Nutria have been found in 30 states in the U.S., and are established in at least 18, including Washington, and Oregon. Nutria were originally introduced to California and the U.S. for the fur-trade in 1899 (CDFW 2020). This introduction failed, however subsequent introductions were successful, as records indicate nutria were present in the Central Valley and South Coast of California in the 1940s and 50s. Nutria were eradicated from the state by the 1970s (CDFW 2020). In 2017, a reproducing population of nutria was discovered in Merced County, and as of May 2019, nutria have been confirmed in San Joaquin, Stanislaus, Tuolumne, Mariposa, Merced, and Fresno counties (CDFW 2020).

B. Damage Caused by Nutria

Nutria cause various kinds of damage to both manmade infrastructure and ecosystems through burrowing, intense herbivory, and carrying pathogens and parasites. Nutria do not construct dens. They burrow, frequently causing water-retention or flood control levees to breech, weakening structural foundations, and eroding banks. While they can consume up to 25% of their body weight in above- and below-ground vegetation each day, they waste and destroy up to 10 times as much, causing extensive damage to the native plant communities and soil structure, as well as significant losses to nearby agricultural crops. Total destruction of aquatic vegetation was observed in East Coast and Gulf Coast wetlands when nutria populations were established (Marx et al. 2004, Pepper et al. 2017). Nutria also serve as hosts for tuberculosis and septicemia, which are direct threats to humans, livestock, and pets. Additionally, nutria carry tapeworms, a nematode that causes a rash known as “nutria itch”, and blood and liver flukes, which can contaminate swimming areas and drinking water supplies.

C. Nutria Take in California

Nutria are considered nongame species in California. Pursuant to CA FGC § 4152, nutria found to be “injuring growing crops or other property may be taken at any time or in any manner in accordance with this code and regulations…” As nutria are invasive and can cause considerable damage to the native ecosystem, CDFW initiated an eradication program. According to CDFW, as of 7/29/2020 1,621 nutria have been removed from the San Joaquin Valley (https://wildlife.ca.gov/Conservation/Invasives/Species/Nutria/Infestation).

D. How Nutria Affect the Environment

The effects of nutria behavior on California's native, natural environments are largely negative. A nutria's intense grazing can cause the loss of plant cover and organic soil matter (roots, rhizomes, tubers) resulting in severe erosion of soils, in some cases destroying marshlands and leaving behind open water. The destructive feeding habits of nutria threaten aquatic and semi-aquatic native vegetation that rely on critical wetland habitats and may be especially damaging to populations of rare, threatened, or endangered species that also rely on these habitats.

IV. Additional Baseline Conditions

Within the proposed action area, many stream and riparian areas have been degraded by the effects of land and water use, including road construction, forest management, agriculture, mining, transportation, urbanization, and water development. Each of these economic activities has contributed to the myriad factors for the decline of species in the proposed action area. Among the most important of these are changes in stream channel morphology, degradation of spawning substrates, reduced in-stream roughness and cover, loss and degradation of estuarine rearing habitats, loss of wetlands, loss and degradation of riparian areas, water quality (e.g., temperature, sediment, dissolved oxygen, contaminants) degradation, blocked fish passage, direct take, and loss of habitat refugia. Climate change is likely to play an increasingly important role in determining the abundance of ESA-listed species, and the conservation value of designated critical habitats.

A. Water Quality and Runoff

Water quality throughout most of the proposed action area is degraded to various degrees because of contaminants that are harmful to species considered in this consultation. Aerial deposition, discharges of treated effluents, and stormwater runoff from residential, commercial, industrial, agricultural, recreational, and transportation land uses are all source of these contaminants. Both the Sacramento River and the San Joaquin River as well as many other water bodies in the Central Valley, have been listed as impaired under the Clean Water Act. Some of this is due to diazinon contamination during the dormant season (for orchards; Holmes and De Vlaming 2003).

The role of stormwater runoff in degrading water quality has been known for years but reducing that role has been notoriously difficult because the runoff is produced everywhere in the developed landscape, the production and delivery of runoff are episodic and difficult to attenuate, and runoff accumulates and transports much of the collective waste of the developed environment (NRC 2009). Hydrologically low-energy areas, where fine-grained sediment and associated contaminants settle, are more likely to have high water temperatures, concentrations of nitrogen and phosphorus that may promote algal blooms, and concentrations of aluminum, iron, copper, and lead that exceed ambient water quality criteria for chronic toxicity to aquatic life (Fuhrer et al. 1996). Even at extremely low levels, contaminants still make their way into salmon tissues at levels that are likely to have sublethal and synergistic effects on individual Pacific salmon, such as immune toxicity, reproductive toxicity, and growth inhibition (Baldwin et al. 2011; Carls and Meador 2009; Hicken et al. 2011; Johnson et al. 2013), that may be sufficient to reduce their survival and therefore the abundance and productivity of some populations (Baldwin et al. 2009; Spromberg and Meador 2006). The adverse effect of contaminants on aquatic life often increases with temperature because elevated temperatures accelerate metabolic processes and thus the penetration and harmful action of toxicants.

The fate and transport of contaminants varies by type, but are all determined by similar biogeochemical processes (Alpers et al. 2000b; Alpers et al. 2000a; Bricker 1999; Chadwick et al. 2004; Johnson et al. 2005). After deposition, each contaminant typically processes between aqueous and solid phases, absorption, and deposition into active or deep sediments, diffusion through interstitial pore space, and re-suspension into the water column. Uptake by benthic organisms, plankton, fish, or other species may occur at any stage except deep sediment, although contaminants in deep sediments become available for biotic uptake when re-suspended by dredging or other disturbances.

Existing road systems contribute to the poor environmental baseline condition. Many miles of highway that parallel streams have degraded stream bank conditions by armoring the banks with rip rap, degraded floodplain connectivity by adding fill to floodplains, and discharge untreated or marginally treated highway runoff to streams. Culvert and bridge stream crossings have similar effects and create additional problems for fish when they act as physical or hydraulic barriers that prevent fish access to spawning or rearing habitat or contribute to adverse stream morphological changes upstream and downstream of the crossing itself.

B. Pesticides and Contaminants

In a typical year in the U.S., pesticides are applied at a rate of approximately five billion pounds of active ingredients per year (Kiely et al. 2004). Therefore, pesticide contamination in the nation’s freshwater habitats is ubiquitous and pesticides usually occur in the environment as mixtures. The Surface Water Ambient Monitoring Program and associated programs monitored surface water toxicity in California over a 10-year period. These programs found that water toxicity was greater in the valleys and along the coast (in more populated areas), and that greater toxicity was observed in agricultural sites (Anderson et al. 2010). Pyrethroid residues were found to be widespread in sediments of agriculturally influenced water bodies from parts of the Central Valley with intense agriculture; some locations had concentrations high enough to be toxic to sensitive species (Weston et al. 2004). Pesticides can be toxic to primary producers and macroinvertebrates, thereby limiting salmon population recovery through adverse, bottom-up impacts on aquatic food webs (Macneale et al. 2010).

SECTION 5: STATUS SPECIES INFORMATION

This BA analyzes potential impacts of the WS-California IWDM program in the NOAA CCO jurisdiction. It will focus on the potential effects of the IWDM program of five federally listed anadromous species, consisting of three federally listed ESUs and six DPS, and their associated critical habitats which may be affected by the proposed action in California’s Coast:

- CC Chinook ESU, threatened
- SONCC Coho Salmon ESU, threatened

- CCC Coho Salmon ESU, threatened
- NC Steelhead DPS, threatened
- CCC Steelhead DPS, threatened
- SCCC Steelhead DPS, threatened
- SCC Steelhead DPS, endangered
- sDPS Green Sturgeon, threatened
- sDPS Eulachon, threatened

Summary information on the nine federally listed populations and their associated designated critical habitats that are considered in this BA are examined in detail below.

I. Chinook Salmon

A. Evolutionary Significant Units

Chinook salmon has one ESU in the California Coast: the **CC ESU**.

- **CC Chinook ESU** was listed as threatened in 1999 (64 FR 50394). The latest status review conducted in 2016 affirmed the threatened status of the species (NMFS 2016). The CC Chinook ESU listing includes all Chinook salmon populations from streams immediately south of the Klamath River in northern California to and including the Russian River. The threatened status of this ESU was reaffirmed in 2005 and seven small artificial propagation programs were also added to the listed ESU (70 FR 37160). Since 2005, all seven artificial programs have been terminated and remain so today. In the 2011 status review, NMFS investigated the Chinook salmon that were straying into coastal stream south of the Russian River (Seghesio and Williams 2016). NMFS determined that the Chinook salmon found in these coastal streams were just as likely to be Central Valley Fall-Run Chinook salmon as they were to be CC Chinook salmon (Seghesio and Williams 2016). There has been no new genetic information to suggest that most of the observed Chinook salmon in these streams are predominately from the CC Chinook ESU (Seghesio and Williams 2016). In the past the CC ESU contained both spring-run and fall-run components. There is historical documentation of spring-runs in the Mad River and North and Middle Forks of the Eel River; however, the spring-run component is thought to be extirpated (Lacy et al. 2016). Most fall-run Chinook salmon return to their natal streams between September and October and spawn soon after entering freshwater. Fall-run CC Chinook salmon adult migration can be later when compared to other fall-run Chinook salmon because the rivers they inhabit open later in the season in response to large winter storms (November through January). The typical life cycle for CC Chinook salmon is to out-migrate as smolts during the spring/summer after hatching, then spend one to five years in the ocean before returning to spawn. Most return as three-year-olds, and a few return as two-year old "jacks" or four year-olds. Very few spend five years in the ocean (Lacy et al. 2016).

  Some factors for listing included: agriculture, logging, ranching, recreation, mining, habitat blockages, water diversions, artificial propagation, estuarine destruction or modification, flooding, hydropower development, instream habitat problems, lack of data, general land use activities, poaching, predation, recreational angling, urbanization, and water development.

Additionally, the distribution CC Chinook ESU was curtailed by dam construction. The spring-run life history form, which historically used upstream habitat that was heavily impacted by construction of dams, was believed extirpated. Several dams were cited as curtailing or blocking access to spawning and rearing habitat within this ESU including Scott Dam on the Eel River. Peters Dam on Lagunitas Creek was also cited as a migration barrier even though the watershed was not included in the ESU.

B. Critical Habitat Designation

- Critical habitat was designated for the **CC Chinook ESU** in 2005 (70 FR 52488). Critical habitat is designated to include the areas defines in the following CALWATER Hydrologic Units: 1) Redwood Creek (Units 1107), 2) Trinidad (Unit 1108), 3) Mad River (Unit 1109), 4) Eureka Plain (Unit 1110), 5) Eel River (Unit 1111), 5) Cape Mendocino (Unit 1112), 7) Mendocino Coast (Unit 1113), and 8) Russian River (Unit 1114). More specific critical habitat details can be found in 70 FR 52488, pages 52537-52547. The physical and biological features (PBFs) of Critical Habitat identified for this ESU can be found in Table 2.

II. Coho Salmon

Coho salmon have two ESUs in California: the **SONCC ESU** and the **CCC ESU**.

A. Evolutionary Significant Units

- The **SONCC ESU** was listed as threatened in 1997 (62 FR 24588). The latest status review conducted in 2016 affirmed the threatened status of the species (NOAA 2016c). The SONCC Coho salmon ESU currently includes populations spawning from Elk River (Oregon) in the north to Mattole River (California) in the south, inclusive (NOAA 2016c). Coho salmon are an anadromous fish species that generally exhibit a relatively simple three-year life cycle. Adults typically begin their freshwater spawning migration in the late summer and fall. Spawn by mid-winter, and then die. The run and spawning times vary between and within populations. Coho salmon fry typically transition to the juvenile stage by about mid-June. Juveniles rear in fresh water for up to 15 months, then migrate to the ocean as “smolts” in the spring. Coho salmon typically spend two growing seasons in the ocean before returning to their natal stream to spawn as three-year-olds (NMFS 2014). Some threats to this ESU include: 1) human-caused habitat degradation, harvest, and artificial propagation and 2) adverse effects from natural environmental variability brought on by drought, floods, and poor ocean conditions (62 FR 24588).

- The **CCC ESU** was originally listed as threatened in 1996 (61 FR 56138). In 2005 the NMFS reclassified the ESU as endangered and listed several conservation hatchery programs that were associated with the ESU (70 FR 37160). CCC coho salmon are the southern-most extant population and ranges from Punta Gorda in southern coastal Humboldt County, California, south to Aptos Creek in Santa Cruz County, California; an area of approximately 2.6 million acres (NOAA 2012). Coho salmon are anadromous fish with a three-year life span; they die shortly after spawning. Adults migrate from the ocean to natal streams in the fall, generally entering freshwater from September through January, with spawning occurring primarily from November to January. Moving south across CCC coho salmon range, the timing of migration occurs later in the winter. Fish will typically enter freshwater in the southern portion of the range from November through January, and spawn into February or early March (NOAA 2012). Coho salmon often are not able to enter freshwater until heavy rains have caused breaching of sand bars that form at the mouths of many coastal California streams. Spawning occurs in streams with direct flow to the ocean, or in large river tributaries (NOAA 2012). Juveniles remain in freshwater for about one year, requiring the use of distinct habitats during summer and winter rearing periods. In the summer, when flows are low, juvenile coho salmon concentrate in deep (>1 meter) cool pools with abundant overhead cover. In the winter, when stream flows are high, juvenile coho salmon require slower water refuge in areas provided by off channel or backwater pools, formed by large woody debris such as fallen trees and root wads (NOAA 2012). After one year in freshwater juvenile coho salmon undergo a physiological transformation into "smolts" for outmigration to the ocean. Smolt outmigration begins in March and peaks in California from April to early June.

Some factors that have led to the decline of CCC coho salmon include logging, agriculture, mining activities, urbanization, stream channelization, dams, wetland loss, water withdrawals, and unscreened diversions have contributed to its decline (63 FR 19552).

B. Critical Habitat Designations

- Critical habitat for the **SONCC Coho ESU** was designated in 1999 and includes all accessible reaches of rivers (including estuarine areas and tributaries) between Cape Blanco, Oregon, and Punta Gorda, California (64 FR 24049). Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassible barriers (i.e., natural waterfalls in existence for at least several hundred years) (64 FR 24049). The PBFs identified for Critical Habitat for this ESU can be found in Table 2.

- Critical habitat for **CCC Coho ESU** was designated in 1999 and encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between Punta Gorda and the San Lorenzo River (inclusive) in California, including two streams entering the San Francisco Bay: Arroyo Corte Madera Del Presidio and Corte Madera Creek (64 FR 24049). Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years) (64 FR 24049). The PBFs identified for Critical Habitat for this ESU can be found in Table 2.

III. Steelhead

Steelhead have four ESUs in California: the **CCC ESU**, the **NC ESU**, the **SCC ESU**, and the **SCCC ESU**.

A. Evolutionary Significant Units

- The **CCC steelhead ESU** was listed as threatened in 1997 (62 FR 43937). The latest status review conducted in 2016 affirmed the threatened status of the species. The CCC steelhead includes all naturally spawned populations of steelhead in coastal streams from the Russian River to Aptos Creek, and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacrament and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley. Two artificial propagation programs are considered to be part of the ESU: the Don Clausen Fish Hatchery and the Kingfisher Flat Hatchery/Scott Creek (Monterey Bay Salmon and Trout Project) (NOAA 2007a). The life history of steelhead is like most Pacific salmon in that they hatch in freshwater, migrate to the ocean, and return to freshwater to spawn. Steelhead are iteroparous, meaning they do not die after spawning, unlike Chinook and coho. The CCC steelhead is comprised of winter-run fish only. Winter-run steelhead are at or near sexual maturity when they enter freshwater (ocean-maturing) during the late fall and winter, and they spawn shortly after arrival in freshwater. The destruction and modification of habitat as well as natural and man-made factors were identified as the primary causes for the decline of the CCC steelhead (NOAA 2007a).

- The **NC steelhead ESU** was listed as threatened in 2000 (65 FR 36074). The latest status review conducted in 2016 affirmed the threatened status of the species. The NC steelhead includes all naturally spawned populations of steelhead in California coastal river basins from Redwood Creek (inclusive) in Humboldt County southward to the Russian River in Sonoma County. Two artificial propagation programs are considered part of the ESU: the Yager Creek Hatchery and the North Fork Gualala River Hatchery (Gualala River Steelhead Project) (NOAA 2007b). The ESU includes winter-run, summer-run, and half-pounder steelhead life history types. Winter-run steelhead are at or near sexual maturity when they enter freshwater (ocean-maturing) during the late fall and winter; they spawn shortly after arrival in freshwater. Summer-run steelhead are immature when they enter freshwater during spring and early summer; they spend several months maturing in freshwater (stream-maturing) prior to spawning. The southern extent of the summer-run life history form occurs at the Mattole River. The half-pounder life history form returns to freshwater in an immature state after a brief two-to-three-month period in the ocean. Half-pounders overwinter in freshwater then return to the ocean in the spring. This unique steelhead life history form has only been observed in the Rogue and Klamath Rivers (of the Klamath Mountain Province steelhead DPS) and the Mad and Eel Rivers (of the NC steelhead ESU) (NOAA 2007b). The loss and degradation of natural habitat and flow conditions are primary driving factors in the decline of the NC steelhead. Mining, agriculture, logging, habitat blockages, and water diversion/extraction are all identified as factors affecting this ESU (NOAA 2007b).

- The **SCC steelhead ESU** was listed as endangered in 1997 (62 FR 43937). The latest status review conducted in 2016 affirmed the endangered status of the species. The final designation for the SCC steelhead encompasses all naturally spawned steelhead between the Santa Maria River (inclusive) and the U.S.-Mexico border. This ESU only includes steelhead whose freshwater habitat occurs below impassible barriers, whether artificial or natural, and which exhibit an anadromous life history. Individuals that have originated in freshwater above impassible barriers and exhibit an anadromous life history are also considered as part of the ESU when they are within waters below the most downstream impassible barriers (NMFS 2012). Migration and life history patterns of southern California steelhead depend more strongly on rainfall and stream flow than is the case for steelhead populations farther north. River entry ranges from early November through June, with peaks in January and February. Spawning primarily begins in January and continues through early June, with peak spawning in February and March (62 FR 43937). The life cycle of steelhead generally involves rearing in freshwater for one to three years before migrating to the ocean and spending one to four years maturing in the marine environment before returning to spawn in freshwater. Out-migration to the ocean usually occurs in the late winter and spring. In some watersheds, juveniles may rear in a lagoon or estuary for several weeks or months prior to entering the ocean. These out-migrating juveniles, termed smolts, live and grow to maturity in the ocean for two to four years before returning to freshwater to reproduce (NMFS 2012). There was no single factor responsible for the decline of southern California steelhead; however, of those factors identified, the destruction and modification of habitat and natural and man-made factors have been recognized as the primary causes for the decline of the SCC steelhead (NMFS 2012).

- The **SCCC steelhead ESU** was listed as threatened in 1997 (62 FR 43937). The latest status review conducted in 2016 affirmed the threatened status of the species. The listing for SCCC steelhead encompasses all naturally spawned steelhead between the Pajaro River (at the border between Santa Cruz and Monterey counties) south to (but not including) the Santa Maria River (at the border of San Luis Obispo and Santa Barbara counties). SCCC steelhead only include steelhead whose freshwater habitat occurs below impassible barriers, whether artificial or natural, and which exhibit an anadromous life history. Individuals originating in freshwater above impassible barriers and exhibit an anadromous life history are also considered as part of the ESU when they are within waters below the most downstream impassible barriers (NOAA 2013). The life history of SCCC steelhead is like that of southern steelhead. They spend one to three years in fresh water, then two to four years at sea before returning to natal rivers to spawn from January to May. Juveniles may migrate from fresh water to lagoons and estuaries, or between reservoirs and tributaries, multiple times in a single year. There was no single factor responsible for the decline of SCCC steelhead; however, those factors identified, the destruction and modification of habitat and natural and manmade factors have been recognized as the primary causes for the decline of this ESU (NOAA 2013).

B. Critical Habitat Designations

- Critical habitat for the **CCC steelhead ESU** was designated in 2005 and includes approximately 1,465 miles of stream habitat in central coastal California and an additional 386 square miles of estuarine habitat in San Pablo and San Francisco Bays (70 FR 52488). The PBFs identified for Critical Habitat for this ESU can be found in Table 3.

- Critical habitat for the **NC steelhead ESU** was designated in 2005 and includes approximately 3,028 miles of stream habitat in Northern California and an additional 25 square miles of estuarine habitat, primarily in Humboldt Bay (70 FR 52488). The PBFs identified for Critical Habitat for this ESU can be found in Table 3.

- Critical habitat for the **SCC steelhead ESU** was designated in 2005 and includes 708 miles of stream habitat from 32 watersheds within its range. Critical habitat includes most, but not all, occupied habitat from the Sana Maria River in southern San Luis Obispo County to San Mateo Creek in northern San Diego County, but excludes some occupied habitat based on economic considerations and all military lands within occupied habitat. Critical habitat was not designated for most of the watersheds south of Malibu Creek with the exception of San Juan Creek and San Mateo Creek (70 FR 52488; NOAA 2012b). The PBFs identified for Critical Habitat for this ESU can be found in Table 3.

- Critical habitat for the **SCCC steelhead ESU** was designated in 2005 and includes a total of 1,240 miles of stream habitat and three-square miles of estuarine habitat from 28 watersheds. Critical habitat for the SCCC steelhead includes most, but not all, occupied habitat from the Pajaro River (at the border between Santa Cruz and Monterey counties) south to (but not including) the Santa Maria River (at the border between San Luis Obispo and Santa Barbara counties), but excludes some occupied habitat based on economic considerations and all military lands within occupied habitat (70 FR 52488; NOAA 2013). The PBFs identified for Critical Habitat for this ESU can be found in Table 3.

Table 3. Salmonid Critical Habitat PBFs by ESU.

ESU / Habitat Area	Freshwater Spawning Sites	Freshwater Rearing Sites	Freshwater Migration Corridors	Estuarine Areas	Nearshore Marine Areas	Offshore Marine Areas	Lateral Extent of Habitat or Other Feature
CA Coastal (CC) Chinook, Central CA Coast (CCC) steelhead Northern CA (NC) steelhead Southern CA Coast (SCC) steelhead South-Central CA Coast (SCCC) steelhead	...with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.	...with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.	...free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.	...free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.	...free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.	...with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation	... the lateral extent of designated critical habitat as the width of the stream channel defined by the ordinary high- water line as defined by the COE in 33 CFR 329.11. In areas for which ordinary high-water has not been defined pursuant to 33 CFR 329.11, the width of the stream channel shall be defined by its bankfull elevation. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain (Rosgen, 1996) and is reached at a discharge which generally has a recurrence interval of 1 to 2 years on the annual flood series (Leopold et al., 1992). …the bankfull elevation can be readily discerned for a variety of stream reaches and stream types using recognizable water lines (e.g., marks on rocks) or vegetation boundaries (Rosgen, 1996).
Central CA Coast Coho (CCCC) Southern OR/Northern CA Coho (SONCC)	Within these areas, essential features of coho salmon critical habitat include adequate; (1) substrate, (2) water quality, (3) water quantity, (4)water temperature, (5) water velocity,(6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions.				None specified	None specified	...consists of the water, substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats) in hydrologic units and counties identified in Table 5 (CCCC) and Table 6 (SONCC) of this part.

IV. Green Sturgeon

There is one DPS of Green Sturgeon that occurs in the Coast of California: the **sDPS**.

A. Distinct Population Segment

- The **sDPS of green sturgeon** was listed as threatened in 2006 (71 FR 17757). The sDPS of the anadromous green sturgeon occurs along the western seaboard of North America and spawns in the Sacramento, Feather, and Yuba Rivers. The northern DPS (nDPS) green sturgeon is considered a NMFS Species of Concern (NMFS 2018) but are not ESA listed; nDPS green sturgeon spawn in the Klamath, Eel, and Rouge Rivers. Non-spawning adult and sub-adult nDPS and sDPS green sturgeon spend much of their lives coexisting in marine and estuarine waters from the Bering Sea, Alaska to El Socorro, Baja California, Mexico (NMFS 2018). Although nDPS and sDPS coexist in the marine environment, the two DPSs only enter the freshwater spawning areas of their respective natal rivers. Adult sDPS enter the San Francisco Bay in late winter through early spring and spawn in the Sacramento River primarily from April through early June, with peaks of activity likely influenced by factors such as water flow and temperature (NMFS 2018). The early life history of the sDPS of green sturgeon has not been well studied, and studies on the nDPS have been used as a proxy. Laboratory studies have indicated that temperature plays an important role in egg and larval development; eggs hatched after 144-192 hours when incubated at a temperature of approximately 15.7°C (NMFS 2018). It is unknown how long juveniles stay in freshwater, but it is likely several months; similarly, it is unknown when they transition to the subadult phase and living in the ocean, but it is likely past their first year (NMFS 2018). The San Francisco Bay Delta Estuary provides year-round habitat for juveniles (rearing) and summer habitat (foraging) for non-spawning sub-adults and adults (NMFS 2018).

  Within the freshwater portion of their range, the sDPS distribution is limited by permanent or flow-dependent barriers. The Keswick Dam, Shasta Dam, and Fremont Weir and Sutter Bypass/Tisdale Weir on the Sacramento River and Oroville Dam on the Feather River are impassible barriers. Potential barriers to adult migration also include the Sacramento Deep Water Ship Channel locks, the Anderson Cottonwood Irrigation District Dam, the Delta Cross Channel Gates on the Sacramento River, and Sunset Pumps on the Feather River. The Fish Barrier Dam on the Feather River and the Daguerre Point Dam on the Lower Yuba River are also recognized as limiting the distribution of the sDPS. Additional potential barriers on the Feather River include the Thermalito Diversion Dam. On the Sacramento River, features such as scour pools, borrow pits, and swales within bypasses can also potentially strand green sturgeon when bypass flooding flows recede (NMFS 2018). The Sacramento River watershed is the only confirmed historical and present spawning area for the sDPS. Within the Sacramento River, the sDPS spawns from the Glenn Colusa Irrigation District area to Cow Creek (NMFS 2018).

  The threatened listing determination was based on: 1) the fact that the spawning adult population occurred in only one river system (i.e., the Sacramento River); 2) evidence of lost spawning habitat in the Sacramento and Feather rivers; 3) threats to habitat quality and quantity in the Sacramento River and Delta System (pollution and legacy contamination);

and 4) fish salvage data exhibiting a negative trend in juvenile sDPS abundance (NMFS 2018).

B. Critical Habitat Designation

- Critical habitat was designated for the **sDPS of green sturgeon** in 2009 (74 FR 52300). Critical habitat includes Coastal U.S. marine waters within 60 fathoms (360 feet) depth from Monterey Bay, California (including Monterey Bay), north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; the lower Columbia River estuary; and certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, Yagquina Bay, and Nehalem Bay), and Washington (Willapa Bay and Grays Harbor). This rule designates approximately 320 miles of freshwater habitat, 897 square miles of estuarine habitat, 11,421 square miles of marine habitat, 487 miles of habitat in the Sacramento-San Joaquin Delta, and 135 square miles of habitat within the Yolo and Sutter bypasses (Sacramento River, CA) as critical habitat for the sDPS (74 FR 52300).

The essential features (i.e., PBFs) for critical habitat, as summarized in the Recovery Plan for the sDPS of North American Green Sturgeon (NMFS 2018), are as follows:

<u>Freshwater riverine systems:</u>

- Food resources. Abundant prey items for larval, juvenile, sub-adult, and adult life stages.
- Substrate type or size (i.e., structural features of substrates). Substrates suitable for egg deposition and development (e.g., bedrock sills and shelves, cobble and gravel, or hard clean sand, with interstices or irregular surfaces to "collect" eggs and provide protection from predators, and free of excessive silt and debris that could smother eggs during incubation), larval development (e.g., substrates with interstices or voids providing refuge from predators and from high flow conditions), and feeding of juveniles, sub-adults, and adults (e.g., sand/mud substrates.)
- Water flow. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages.
- Water quality. Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
- Migratory corridor. A migratory pathway necessary for the safe and timely passage of all life stages within riverine habitats and between riverine and estuarine habitats (e.g., an unobstructed river or dammed river that still allows for safe and timely passage).
- Depth. Deep (≥ 5 m) holding pools for both upstream and downstream holding of adult or sub-adult fish, with adequate water quality and flow to maintain the physiological needs of the holding adult or sub-adult fish.
- Sediment quality. Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

Estuarine habitats:

- Food resources. Abundant prey items within estuarine habitats and substrates for juvenile, sub-adult, and adult life stages.
- Water flow. Within bays and estuaries adjacent to the Sacramento River (i.e., the Sacramento-San Joaquin Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds.
- Water quality. Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
- Migratory corridor. A migratory pathway necessary for the sage and timely passage of all life stages within estuarine habitats and between estuarine and riverine or marine habitats.
- Depth. A diversity of depths necessary for shelter, foraging, and migration of juvenile, sub-adult, and adult life stages.
- Sediment quality. Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

Nearshore coastal marine areas:

- Migratory corridor. A migratory pathway necessary for the safe and timely passage of all life stages within marine and between estuarine and marine habitats.
- Water quality. Nearshore marine waters with adequate dissolved oxygen levels and low enough levels of contaminants (e.g., pesticides, organochlorines, elevated levels of heavy metals) to allow normal behavior, growth, and viability of sub-adult and adult green sturgeon.
- Food resources. Abundant prey items for sub-adults and adults, which may include benthic invertebrate fishes.

V. Eulachon

A. Distinct Population Segment

- The **sDPS of eulachon** was listed as threatened in 2010 (75 FR 13012). The latest status review conducted in 2016 affirmed the threatened status of the species. Eulachon, an anadromous smelt, are endemic to the northeastern Pacific Ocean; they range from northern California to southwest and south-central Alaska and into the southeastern Bering Sea. The sDPS of eulachon is comprised of fish that spawn in rivers south of the Nass River in British Columbia to, and including, the Mad River in California (NMFS 2017). In the portion of the species' range that lies south of the U.S.-Canada border, most eulachon production originates in the Columbia River Basin, including the Columbia River, the Cowlitz River the Grays River, the Kalama River, the Lewis River, and the Sandy River. Historically, the only other large river basins in the contiguous United States where large, consistent spawning runs of eulachon have been documented are the Klamath River in northern California and the Umpqua River in Oregon. However, eulachon have been found both frequently and infrequently in several, but not all, coastal rivers in northern California including: the Mad River, Redwood Creek, and Humboldt Bay. Eulachon may have historically occurred in the

Sacramento River system and even farther south along the California and Baja California coast, in areas where they may have been extirpated (NMFS 2017). Eulachon spend 95-98% of their lives at sea, and they are fundamentally semelparous, although some individuals may spawn twice in their lifetime. Entry into the spawning rivers appears to be related to water temperature and the occurrence of high tides. Typically, spawning runs occur from January through March in the Columbia River, the Klamath River, and the coastal rivers of Washington and Oregon (76 FR 65324). The historical landings data for the Klamath River subpopulation is limited. The only reliable landings data is for 1963, when a total of 650,000 fish were reported to have been landed. Recent data from the Yurok tribal fisheries biologist reported capturing adult eulachon in presence/absence surveys (seine/dip nets) in the Klamath River over a four-year period [2011 (7 eulachon), 2012 (40 eulachon), 2013 (112 eulachon), and 2014 (1,000 eulachon)] (NMFS 2017). The Biological Review Team (BRT) of the 2017 Recovery Plan categorized climate change impacts on ocean conditions as the most serious threat to the persistence of eulachon in all four subpopulations of the DPS: Klamath River, Columbia River, Fraser River, and British Columbia coastal rivers south of the Nass River. Other top threats include dams and water diversions in the Klamath and Columbia rivers and predation in the Fraser and British Columbia coastal rivers (NMFS 2017).

B. Critical Habitat Designation

- Critical habitat was designated for the **sDPS of eulachon** in 2011 (76 FR 65324). The areas in California that are designated as critical habitat include: 1) the Mad River (from the mouth of the river upstream to the confluence with the North Fork Mad River), 2) Redwood Creek (from the mouth of the creek upstream to the confluence with Top McDonald Creek), and 3) Klamath River (from the mouth of the river upstream to the confluence with Omogar Creek (76 FR 65324).

  The PBFs are summarized below; specific details can be found at 76 FR 65324 pages 65333-65334.

  <u>The components of freshwater spawning and incubation sites include:</u>
  - Flow. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) that supports spawning and survival of all life stages.
  - Water Quality. Water quality suitable for spawning and viability of all eulachon life stages.
  - Water temperature. Suitable water temperatures within natural ranges in eulachon spawning reaches.
  - Substrate. Spawning substrates for eulachon egg deposition and development.

  <u>The components of freshwater and estuarine migration corridor sites include:</u>
  - Migratory Corridor. Safe and unobstructed migratory pathways for eulachon adults to pass from the ocean through estuarine areas to riverine habitats to spawn, and for larval eulachon to access rearing habitats within the estuaries and juvenile and adults to access habitats in the ocean.

- Flow. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-or-change of freshwater discharge overtime) that supports spawning migration of adults and outmigration of larval eulachon from spawning sites.
- Water Quality. Water quality suitable for survival and migration of spawning adults and larval eulachon.
- Water Temperature. Water temperatures suitable for survival and migration.
- Food. Prey resources to support larval eulachon survival.

<u>The components of nearshore and offshore marine foraging sites include:</u>

- Food. Prey items in a concentration that supports foraging leading to adequate growth and reproductive development for juveniles and adults in the marine environment.
- Water Quality. Water quality suitable for adequate growth and reproductive development.

SECTION 6: CONSERVATION MEASURES

WS-California will continue to monitor ESA listings and keep its employees informed of the status of T&E species in California and provide them with current maps and information. Additionally, the conservation measures listed below will be followed by WS-California to prevent or reduce impacts that may have the potential to result from the proposed action.

1. WS-California field staff will receive environmental awareness training on the spawning, incubation timing, and area information for each listed salmonid.

2. WS-California will give preference to nonlethal methods per WS Directive 2.101. To accomplish this, WS-California shall ensure:

   a. The land/resource owner at beaver removal sites within critical habitat and EFH will receive a copy of NMFS' beaver information pamphlet.
   b. When working with long term cooperators, WS-California will recommend utilization of nonlethal methods such as flow devices and appropriate levee design to minimize semi-aquatic mammal damage issues.
   c. Recommend that land/resource owners at beaver removal sites retain some woody material in the waterway to the extent that is safe and practicable.

3. WS-California Staff will attempt to recover all semi-aquatic mammal carcasses from the waterway during lethal removal activities.

SECTION 7: EFFECTS OF THE PROPOSED ACTION

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.17).

I. Impacts of WS-California Methods

- **Exclusion.** WS-California typically recommends appropriate exclusion strategies as part of technical assistance provided to requestors rather than WS-California personnel physically installing exclusion devices. In limited circumstances, WS-California may install exclusionary material such as wire mesh around trees, or dock and marina pilings. These materials would be wrapped around posts/trunks and not capable of capturing or otherwise directly affecting fish. Beneficial effects to salmonids may be realized through use of exclusionary measures to manage beaver damage because they allow beaver to remain on the landscape and create beneficial salmonid habitat and large woody material input to river systems throughout the lifetime of the beaver. WS-California expects that direct impacts to ESA- listed salmonid, sturgeon, and eulachon and their critical habitats are insignificant and discountable.

- **Notching.** Wildlife-Services California sometimes removes a small section of a dam to create the sound or running water. The water level will not be altered, and woody debris will not be removed from the site. Because of this, dam notching will have little to no effect on individual fish as it is a minor, temporary change used to ascertain beaver presence and numbers.

- **Trapping.** WS-California uses the traps and equipment detailed in Section Three to respond to damage caused by semi-aquatic mammals. WS-California identifies target species' signs, tracks, and trails then uses trap type, location, and positioning to effectively target damaging individuals and reduce non-target exposure. WS-California reviewed management records back to 2006 and found no records of fish captured in traps set for semi-aquatic mammals in California. Based on trap design and application, thousands of trap nights without non-target fish captures, and the locations where WS-California conducts most semi-aquatic mammal trapping (e.g., in drainage structures, irrigation ditches, leveed river channels, etc.), WS-California believes that direct impacts to ESA-listed salmonids, sturgeon, and eulachon and their critical habitats would be discountable because it is highly unlikely that these fish species would be captured in a trap.

- **Shooting.** WS-California uses shotguns, pistols, and rifles to remove semi-aquatic mammals. Shooting performed by WS-California personnel is highly target specific as WS personnel are trained to only shoot at identified targets and use a safe backstop. WS-California reviewed historical control records dating back to 2007 and found no record of any fish being shot by WS-California personnel. Furthermore, carcasses are recovered and properly disposed of whenever possible. WS-California believes that the direct impacts to ESA-listed salmonids, sturgeon, and eulachon and their critical habitats from this method would be insignificant and discountable.

II. Impacts of WS-California Actions

- **Staff Site presence at management sites.** All WS-California semi-aquatic mammal damage management actions require personnel to access waterways. Site presence effects include those that would be caused by personnel accessing the site to perform IWDM on foot and by ground vehicle. As most requests for assistance with semi-aquatic mammal management are associated with human altered environments, waterways accessed by WS-California personnel are also typically accessed by other entities, agencies, and members of the public. As such, access by WS-California personnel would not present a change for the baseline conditions of the site, (i.e., no riparian vegetation will be removed during staff ingress or egress from removal sites). The majority of IWDM actions are carried out on foot and require only one person to walk less than 100 feet and stand in a waterway for a short period of time to set or check equipment. If fish are exposed to WS-California personnel near or in the water, individual fish may be temporarily displaced. Personnel may also generate minor amounts of suspended sediment during management activities at some sites. Both effects will be short-term and not likely to injure, harm, or reduce the fitness of any individual fish. WS-California may occasionally use ground vehicles to access IWDM sites. Use of ground vehicles to access sites will be restricted to established roads and routes. Waterways will not be accessed when redds or spawning salmon are visible to personnel. WS-California expects its use of ground vehicles, or the presence of personnel will have insignificant and discountable direct impacts to ESA listed salmonids, sturgeon, and eulachon and their critical habitats.

- **Obstructed Culverts.** Human created narrow water passage structures, such as culverts and water control boxes, are particularly susceptible to plugging by beavers. These structures are often used to pass water below roads, rails, and other infrastructure. Water obstructed by plugged culverts can damage infrastructure but may also present a fish passage problem for migrating salmonids (Collen and Gibson 2001), especially considering most culverts and control boxes already present passage issues for salmon, unless specifically designed to address fish passage. Plugged culverts primarily exist in highly modified environments making it unlikely that the water trapped behind the obstruction can create preferred habitat for juvenile salmonids as a completely blocked culvert will prevent juvenile salmonid outmigration to estuarine and marine areas, a necessary part of their life cycle. Damming of culverts and water control boxes typically causes upstream flooding that is very noticeable and quickly reported. Agencies responsible for protection of the infrastructure are quick to remove debris to prevent such damage, which also prevents the development of ponding and floodplain conditions that would otherwise be attractive to juvenile salmonids. Unplugging the culverts in the late spring through the fall ensures ESA-listed salmonid adults' access to more upstream spawning habitat. As such, WS-California finds that the act of unplugging culverts would have a discountable effect on juvenile salmonids and a likely beneficial effect on adult salmonids, sturgeon, or eulachon by supporting open migration corridors in highly modified environments.

- **Removing Obstructions from Roadside and Irrigation Ditches.** Roadside and irrigation ditches are unlikely to be or have the potential to be good fish habitat. They are often isolated from other waterways and are regularly maintained to prevent blockages that may erode the bank structure and lead to a complete loss of the channel and water flow. Because these ditches are unlikely to support good fish habitat, WS-California believes that the impacts on ESA listed salmonids, sturgeon, and eulachon from this activity would be insignificant and discountable.

- **Muskrat removal.** WS-California conducts muskrat damage management in a limited number of locations, most often for the protection of dikes, levees, and other impoundments. Muskrat do not create structural elements or introduce large woody debris to the watershed that might positively affect salmonid habitat. While little was found regarding muskrat damage effects on salmonid, sturgeon, or eulachon habitat, some research has found that the increase in sedimentation of the Fall River and changes in stream morphology associated with muskrat burrowing may have detrimental effects on the Fall River wild trout fishery (Shuler 2000). As such, WS-California believes that the impacts from the removal of this species on ESA-listed salmonids, sturgeon, and eulachon and their critical habitats are insignificant and discountable.

- **Invasive Nutria Removal.** Nutria do not create structure or otherwise provide any positive affect on habitat for salmonids, sturgeon, or eulachon. Nutria are an invasive species that are documented as being able to degrade large areas of native wetland habitats and shorelines by burrowing into banks and consuming copious amounts of wetland vegetation relatively quickly. As such, removal of this species by WS-California is expected to protect native wetland habitats and is therefore predicted to have a beneficial effect on listed species dependent on aquatic environments including listed salmonids, green sturgeon, eulachon and associated critical habitats.

- **Beaver Relocation.** CDFW is the agency charged with managing beavers within the State of California. Animals trapped for depredation must be euthanized or released on site unless the situation is specifically exempted. CDFW has a policy against relocating damage causing animals. Beaver relocation has been tried in various locations with varying success rates reported at 25-50% (Petro 2013, McKinstry and Anderson 2002). Of particular concern is the low number of beavers which remain loyal to the release location, many return, or attempt to return, to the capture location. WS-California cannot currently make the decision to relocate beavers as part of regular management activities and rarely participates in the process when relocation is directed by CDFW. As discussed in Section Three, new policies are being developed by CDFW regarding beaver depredation and management; relocations may become more common in the future. However, relocation of beavers to areas with the intention of improving habitat would likely benefit ESA-listed salmonids. WS-California finds the effects of relocation would be insignificant or discountable for ESA-listed sturgeon and eulachon and associated critical habitat.

- **Beaver Removal.** The direct components of beaver removal (site access, equipment, and methods) considered as a case-by-case basis are not expected to have measurable effects on salmonids, green sturgeon, eulachon, or associated critical habitat.

  When considering consistent beaver removal from portions of the landscape as a damage management tactic:

  - **Beaver removal by WS-California is not expected to have direct or indirect impacts on eulachon or its critical habitat.** Eulachon are limited to a small area of California that does not overlap with the main areas in which beaver management occurs.

- **Beaver removal by WS-California is not expected to have direct or indirect impacts on sDPS green sturgeon or its critical habitat.** Green sturgeon inhabit deeper waters and areas where beaver activities are unlikely to be able to affect habitat (the main channel of rivers).

- **Beaver removal in some locations is expected to have the potential to indirectly affect juvenile salmonids negatively.** WS-California recognizes that beaver can positively and negatively affect the habitat of salmonids. Depending on the location, beaver can be important contributors to creating long and short-term habitat beneficial for listed salmonids (Bouwes et al 2016, Weber et al. 2017) but can also create fish passage and sedimentation issues in other settings (Malison et al. 2016). As beavers can have different effects on salmonids depending on the habitat in which the beaver activity occurs, WS-California will discuss the different the effects of beaver removal similarly.

- **Beaver removal where indirect effects will not occur.** The majority of WS-California beaver removal from ESA-listed salmonid habitat will occur without adverse effects to the fish or their habitat. A beaver's primary positive impact on salmonids is through creation of dams, which leads to the development of rearing habitat upstream and cooling effects in river reaches. Beaver removal that occurs where beaver dams cannot be created are unlikely to adversely affect listed salmonids because the rearing habitat will only be augmented if a dam and ponding can occur, otherwise the rearing habitat will remain the same with or without beaver presence. WS-California defines these areas as:

  - **Sites where beaver dams will not create habitat.** This includes sites where dams can be built but the geography of the site (i.e. gradient, depth, width, and water velocity) and man-made structures prevent the creation of ponds/rearing habitat (Suzuki and McComb 1998, Swinnen et al 2019, Hartman and Tornlov 2005). Examples of this are irrigation and roadside ditches.
  - **Sites where beaver dams are not allowed to persist.** Certain infrastructure is regularly inspected due to public safety concerns and any debris is removed by responsible agencies at such intervals that a beaver dam, and therefore any habitat created by it is not allowed to develop. Removal of beavers in these areas will have no adverse effect on salmonids as habitat for juvenile salmonids cannot be created regardless of the presence/absence of beavers. Whether beaver are lethally removed or not, the habitat augmenting features they install will be removed regularly and rapidly through human maintenance of the waterways.
  - **Sites where beaver activity completely obstructs culverts and water control boxes resulting in complete obstruction of fish passage or severe water flow restriction.**
  - **Habitat restoration and conservation sites and T&E recovery sites.** Removal of beavers damaging plantings or sedimenting gravel bars intended to improve riparian habitat will not adversely impact salmonids because beaver activity at these sites is hindering efforts to improve salmonid habitat. Beavers removed from sites where their activity is blocking/restricting water flow to fish hatcheries where T&E salmonid recovery activities are taking place. Beaver removal at these locations is requested to benefit recovery efforts for T&E salmonids.

- **Beaver removal where indirect effects may occur.** WS-California may be requested to resolve beaver damage in locations where a beaver dam could increase, maintain, or improve salmonid habitat. After beaver removal, existing habitat features may degrade, or the development of such features will cease because the beavers will not be there to maintain existing dams or build new ones (Pollock et al. 2017). Conditions at such a location may degrade, resulting in some juvenile salmonids moving to an alternate location; potentially causing fry to expend energy resulting in a decrease in overall fitness and could be more susceptible to predation. Offspring from a watershed without beaver augmented habitat would be expected to be less successful in making it to the ocean compared to a watershed with available beaver-associated habitat elements, due to less available freshwater forage, predator cover, and favorable in-river temperatures.

  However, WS-California beaver removals are not the only situations in which beaver dams fail. During a 17-year study of beaver dams along a native stream, Demmer and Beshta (2008) found that the number of beaver dams present along the creek varied from nine to 103 dams per year: indicating a highly variable amount of beaver activity and sporadic changes to conditions within the creek. Peak spring run-off events and periodic beaver abandonment were the most common causes of dam breaches during their study. Natural dam breaches were commonly recorded with only one year (1992) in 17 having no breach recorded and only one dam surviving along the entire stream course during 1998 (Demmer & Beshta 2008). Kemp et al. (2012) and Pollock et al. (2012) found that many dams commonly failed within their first season.

  The estimated locations of beaver management identified by WS-California field staff over the previous five-year period (2013-2017) were overlaid onto a map of the area under the California Coastal office's jurisdiction (Figures 3, 4, and 5). Many of the historical sites identified by WS-California staff occur where salmonids are expected to occur. Although the sites are sporadic and spread out in the California Coastal area, it is expected that beaver removal will have indirect negative effects on salmonids through habitat changes resulting from the decline of beaver-maintained dams and other woody debris input.

III. Summary of Species Effects

WS-California beaver removal methods are expected to have minimal effects on ESA listed fish as it is unlikely that a fish will get caught in a trap or shot. Staff presence near waterways may have temporary disturbance effects when personnel access the waterway, however care will be taken not to disturb critical behaviors like redd creation or spawning. Effects to individual fish from site presence are expected to be short lived and temporary. These effects are not expected to have an impact on overall fitness. WS-California will have some beaver removal sites that are in ESA-listed fish habitat. WS-California expects that it **May Affect, Not Likely to Adversely Affect** individual eulachon and sturgeon indirectly through beaver removal. WS-California expects that it **May Affect, Likely to Adversely Affect** individual ESA-listed salmonids indirectly through beaver removal, because beavers contribute to the PBFs.

Figure 3. Map of the Northern California Coast and the estimated locations where beaver work was performed 2013-2017. Green shaded area is essential fish habitat for salmonids.

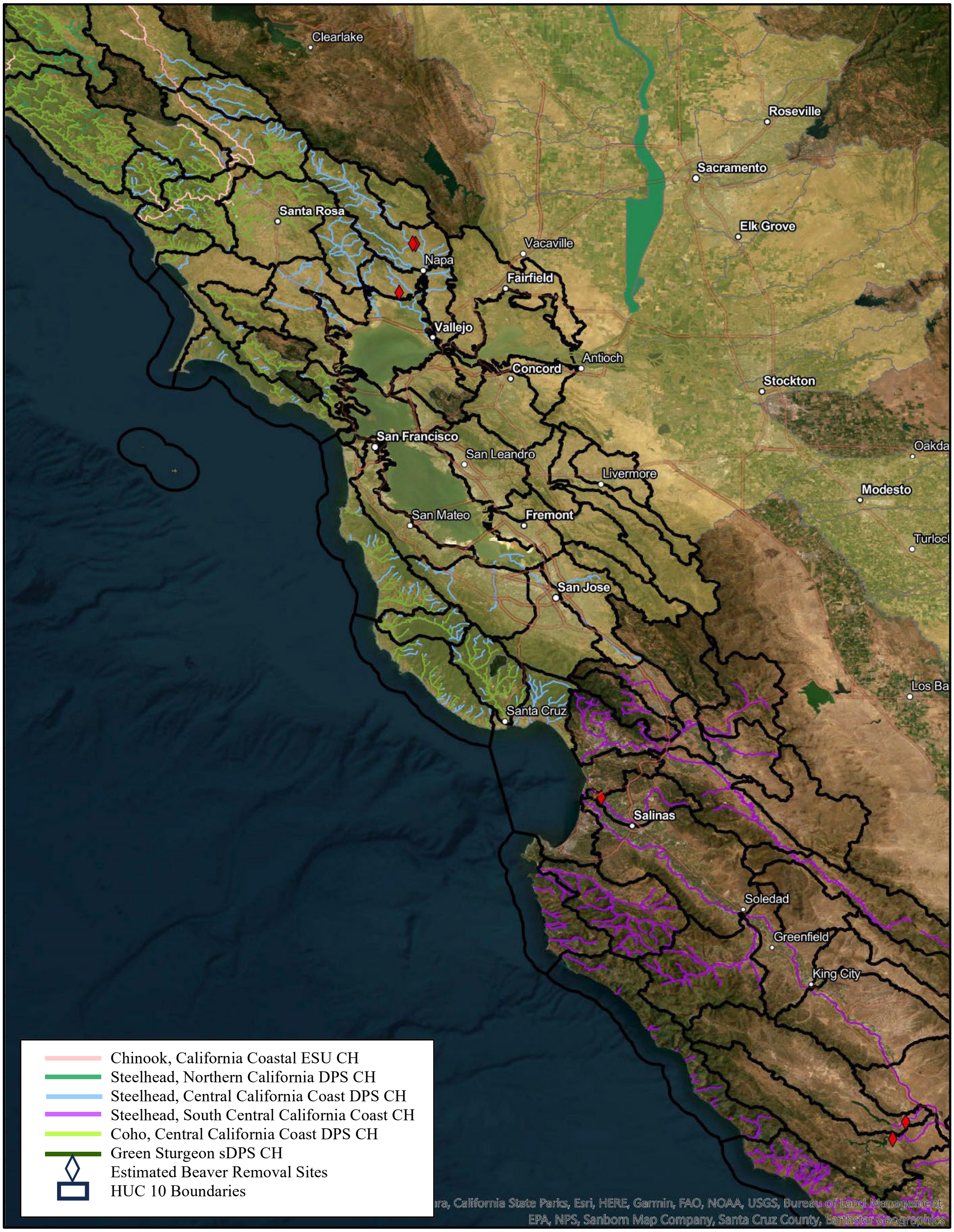

Figure 4. Map of the Central California Coast and the estimated locations where beaver work was performed 2013-2017. Green shaded area is essential fish habitat for salmonids.

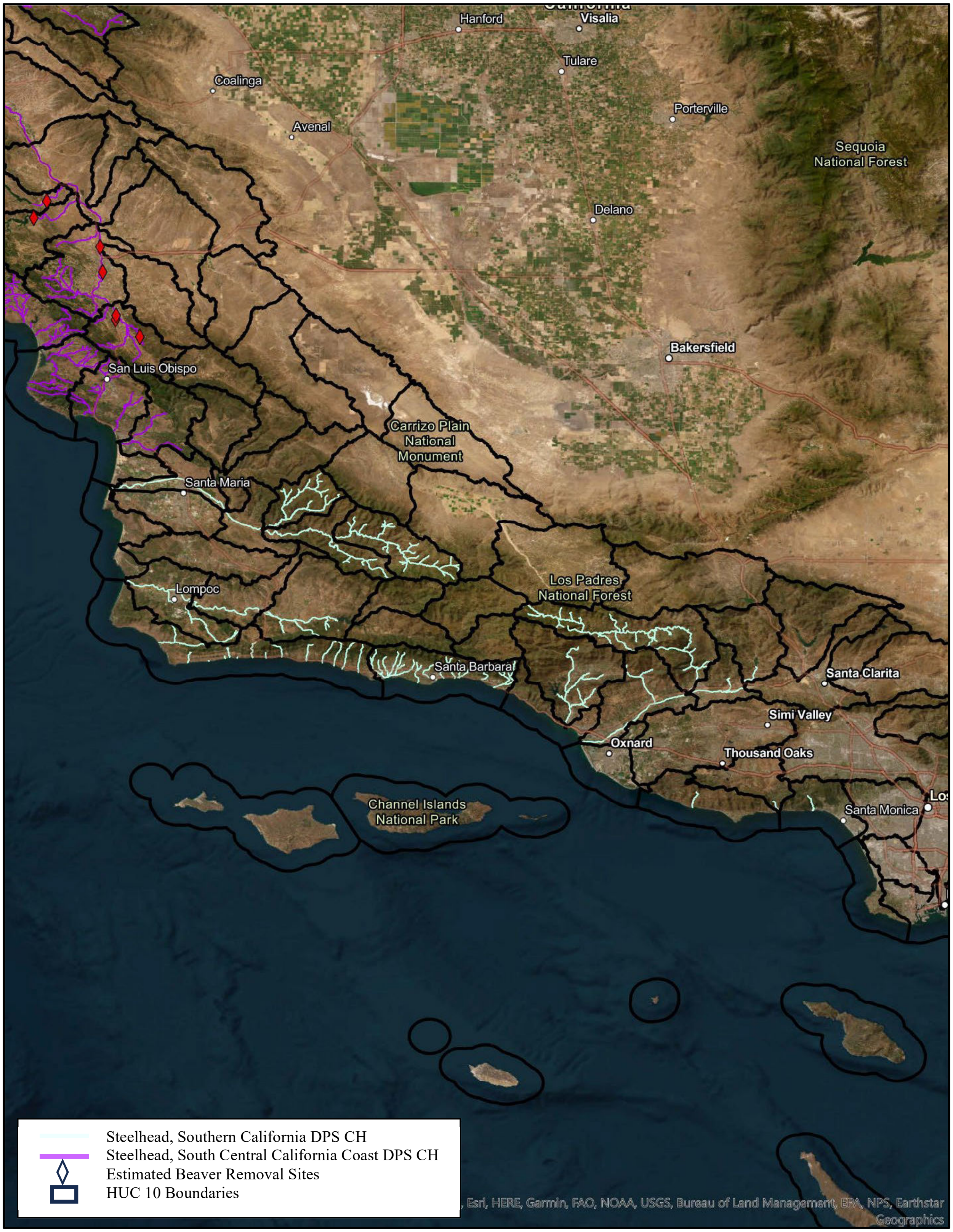

Figure 5. Map of the Southern California Coast and the estimated locations where beaver work was performed 2013-2017.

VI. Impacts of IWDM on Critical Habitat

WS-California is not proposing to remove or construct any temporary or permanent roads or structures, install any impervious surfaces, discharge any chemicals or sediment into waterways, or otherwise affect water quality, dredge material from waterways, alter the amount of forage/prey available, increase the quantity of predatory species present, install any equipment that would affect fish passage, or remove any vegetation in occupied or critical habitat of ESA listed fish. WS-California is proposing to manage aquatic mammal damage through lethal removals of nutria, muskrat, and beaver, unplugging culverts, and removing obstructions in agricultural irrigation ditches.

In the case of ESA-listed salmonids, beaver dams are specifically identified as an important element of freshwater rearing sites. They also add woody debris to the habitat that may support beneficial habitat for ESA-listed salmonids. However, beaver dams and large woody debris are not identified as an element of critical habitat for the sDPS of green sturgeon or sDPS of eulachon. Because of this, WS-California IWDM activities are not expected to adversely affect sDPS green sturgeon critical habitat or sDPS eulachon critical habitat and will not be discussed further.

WS-California considered the PBFs of the potentially affected salmonid Critical Habitat listings with WS-California actions in various habitat settings to assess the effects of the program on Critical Habitat. The PBF characteristics (site attributes) that could be affected by the proposed action are substrate, water quality, water quantity, floodplain connectivity, forage, natural cover, and migration obstruction. The effects to PBFs described below apply to all ESA-listed salmonids considered in this BA.

- **Freshwater Spawning Sites** with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.

- **Freshwater Rearing Sites** with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

- **Freshwater Migration Corridors** free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

- **Estuarine Areas** free of obstructions with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Not all beavers in critical habitat create dams (Kemp et al. 2012, Pollock et al. 2012). WS-California determined that the removal of beavers from areas where beaver activity would not positively affect PBFs (e.g., channels greater than 33ft., isolated bodies of water) either because dams would not be allowed to persist or because they are not connected to other waterways, would not affect critical habitat. However, WS-California estimates that we could be asked to remove beavers from no more than 50 sites within the CCO jurisdiction that could benefit ESA-listed salmonid critical habitat. In those areas WS-California expects that there could be impacts to salmonid critical habitat PBFs.

V. Summary of Critical Habitat Effects

WS-California expects that it will have **No Effect** on the critical habitats of eulachon and green sturgeon. WS-California expects that it **May Affect, Likely to Adversely Affect** critical habitat of listed salmonids. At the locations where beavers are taken, they will not be there to maintain existing dams or build new ones (Pollock et al. 2017). As a result, the beaver enhanced PBFs described above could degrade or ongoing PBF enhancement could cease (except for the migration obstruction PBF). However, beaver removal sites will be dispersed geographically and temporally across the action area. The potential effects for each removal event are limited to a small amount of stream reach and rearing habitat that could be affected at each site (i.e., an average 9,061 ft^2 of beaver pond at sites where beaver dams exist), relative to the size of any given HUCs, each of which can include several miles of rearing habitat (NMFS 2019).

VI. Cumulative Effects

Cumulative effects include future state, private, and non-federal activities that are reasonably certain to occur within the action area. It is reasonably foreseeable that the effects of recreational and commercial harvest, hydropower dams, chemical contaminants, manmade structures from non-federal sources would be at similar levels to the environmental baseline.

Since fur trapping in California has been eliminated by the Wildlife Protection Act of 2019, statewide fur harvest and beaver removal will likely decrease compared to past years. CDFW and other entities are likely to continue operating fish hatcheries, promoting beaver populations, and creating salmon habitat at the same or increased rate in the foreseeable future, resulting in further benefits to salmonids.

CDWR is likely to have similar levels of beaver activities and beaver removal. Since CDWR maintains its structures routinely, beavers will likely not be able to create habitat that is valuable to listed salmonids and sturgeon. Transportation departments may have temporary impacts to salmonids and sturgeon with culvert and road structure replacements. Without WS-California conducting the proposed action, CDWR and transportation departments are likely to maintain the level of lethal beaver removals as conducted by WS-California during the past five years by contracting with private pest control operators.

The level of landowners removing beaver on their private property is likely to remain unchanged. However, since this take is not required to be reported to CDFW, the past or future levels of beaver removal is unknown. Without WS-California conducting the proposed action, private landowners are likely to increase their take of beaver due to misidentification and removal of non-problem beaver and misperception of damage threats from beaver.

In California a permit is required under FGC 4181 for the removal of beavers causing damage. Additionally, if the entity is removing debris or installing water flow devices a Lake and Streambed Alteration Agreement may be required by CDFW (FGC 1602). CDWR as well as other entities such as CalTrans and private individuals may clear culverts more frequently or remove the beaver on their own or may choose to hire private pest control operators to remove beaver. If WS-California does not provide this assistance, there is no federal or state regulation that prevents the land/resource owner/manager from legally removing beaver themselves pursuant to the afore mentioned permits and agreements.

SECTION 8: NEED FOR REASSESSMENT

This BA and the findings are based on the best current data and scientific information available. WS-California will reconvene with NMFS CCO within three months of submitting the first annual report to discuss the effectiveness and implementation of this consultation's terms and conditions, take limitations, and the impacts of WS-California's IWDM activities and associated take on ESA-listed salmonids, sturgeon, and eulachon, and their habitats.

I. Monitoring and Documentation

A. Monitoring

- WS-California staff will notify NMFS CCO within 24 hours if any listed anadromous fish are observed stranded or blocked, with information on the type, approximate number, and location of stranded fish. WS-California staff will not attempt to handle or relocate any live fish.
- WS-California will alert NMFS, within 48 hours, if it becomes apparent that a take threshold has been exceeded.

B. Documentation

WS-California personnel will collect the following data for each beaver removal site that could have an effect on salmonid habitat. (More than one beaver may be removed from each site.)

- County of removal (counties to include in this report have been defined by the NMFS CCVO and CCO)
- HUC10 of removal
- Number of beavers removed
- Presence of a dam (none, partial, full)
    a. Estimate of ponded area (square feet)

II. Annual Reporting

WS-California will submit a monitoring report to NMFS CCO by March 1 of each calendar year that describes the previous year's implementation of the proposed action. The report will include the following information for removal sites at which beaver removal could affect salmonid habitat:

- Number of beavers removed by HUC10
- The number of beaver removal sites by HUC10
- The cumulative number of beavers removed and beaver removal sites over the previous five years, by HUC10 (moving forward from the completion of this consultation)
- Number of dams present at beaver removal sites by HUC10

SECTION 9: MAGNUSON STEVENS ACT (MSA) ESSENTIAL FISH HABITAT CONSULTATION REQUEST AND EFFECTS ANALYSIS

The Magnuson-Stevens Fishery Conservation and Management Act (P.L. 94-265) was first passed in 1976 with the aim of developing a long-term biological and economic sustainability of our nation's marine fisheries (NOAA 2020). Agencies responsible for federal actions that are determined to have an adverse effect on Essential Fish Habitat (EFH) are required to consult NOAA Fisheries under MSA. WS-California has concluded that its semi-aquatic mammal damage management program (described in detail in Section 3) has the potential to adversely affect EFH for CC ESU Chinook, SONCC ESU Coho, CCC ESU Coho, NC ESU Steelhead, CCC ESU Steelhead, SCCC ESU Steelhead, SCC ESU Steelhead where beaver are able to enhance salmonid habitat.

I. Description of the Action

The description of the action and action area of this project as described in detail in Section 3 of this document. Much of this action area is also considered EFH for various life-history stages of Pacific Coast salmon (Chinook and coho) and steelhead. Beaver activities often have a positive effect on salmonid habitat as discussed in Section 4, Part 1. In addition, beaver ponds are listed as an element of the salmon habitat areas of particular concern (HAPC) "Complex Channels and Floodplains" (Pacific Fishery Management Council 2014). Their structures introduce more heterogeneity of water temperature, reduce silt loads, provide refugia and holding areas, and provide habitat for invertebrate prey species.

WS-California uses IWDM to address damage caused by beavers upon request by the landowner/manager. The components of this IWDM are described in Section 3, Part 7 and analyzed in Section 7.

II. Adverse Effects Analysis and Conclusions

The techniques employed to remove beavers themselves are not expected to have any long-term effects on EFH. Personnel accessing the stream may cause some short-term disturbances when placing equipment or using a boat in the waterway, but those disturbances are unlikely to change the baseline conditions of the waterway. The removal of the beavers from waterways is expected to have adverse impacts on EFH. Beaver activity in waterways, especially those activities that introduce large woody debris and damming has been shown to be beneficial to salmonids.

WS-California has limited beaver removal in the California Coastal area. Because of this, the negative impacts on EFH would be short-term and minimal. Beaver removal impacts on habitat are discussed in further detail in Section 7.

III. Mitigation

The Minimizing Measures discussed in Section 6 are expected to reduce the indirect impacts of beaver removal to EFH. They are summarized below.

- Beaver removal sites will be tracked as outlined in Section 6, Measure 1.
- WS-California will not manage debris except as outlined in Section 6, Measure 2.
- Nonlethal methods will be given preference.

SECTION 10: LITERATURE CITED

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June 11, 2019

To: Memo to File

From: Dennis L. Orthmeyer

Subject: Section 7(d) Determination with respect to the Chinook salmon (*Oncorhynchus tshawytscha*), Coho salmon (*Oncorhynchus kisutch*), Steelhead (*Oncorhynchus mykiss),* Green sturgeon (*Acipenser medirostris*), Pacific eulachon (*Thaleichthys pacificus)* and their critical habitats.

On March 12, 2019, WS-California sent a letter to the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) requesting consultation pursuant to Section 7 of the Endangered Species Act (ESA) for those threatened and endangered species (T&E) found in the State of California under NMFS' jurisdiction that may be affected by WS-California's statewide aquatic mammal damage management activities. With the sending of that letter, consultation is now open. Also on March 12, 2019, NMFS acknowledged receipt of that letter and committed to continuing to work with WS-California through the process of the ESA consultation.

The specific T&E species and associated critical habitat at issue in the Section 7 consultation with NMFS are:

- Chinook salmon (*Oncorhynchus tshawytscha*);
  - California Coastal Evolutionarily Significant Unit (ESU);
  - Central Valley spring-run ESU;
  - Sacramento River winter-run ESU;
- Coho salmon (*Oncorhynchus kisutch*);
  - Central California Coast ESU;
  - Southern Oregon/ Northern California ESU;
- Steelhead (*Oncorhynchus mykiss*);
  - California Central Valley ESU;
  - Central California Coast ESU;
  - Northern California ESU;
  - Southern California ESU;
  - South-Central California Coast ESU;
- Green sturgeon (*Acipenser medirostris*); and the
- Pacific eulachon (*Thaleichthys pacificus)*.

Damage attributed to aquatic mammals in California includes threats to human health and safety, property, agriculture, and natural resources. In the five-year period from calendar year (CY) 2014 to 2018, WS-California received 908 requests for assistance resolving conflicts with aquatic mammal species. The aquatic mammal species commonly reported to cause damage in California are the North American beaver (*Castor canadensis*), Muskrat (*Ondontra zibethicus*), and Nutria (*Myocastor coypus*).

Agricultural and property damage attributed to beavers include the destruction of nursery stock, orchards, timber, and landscaping, as well as flooding of field and row crops. This type of beaver damage results in significant financial losses for California resource owners. In addition to agricultural and property damage, beavers threaten infrastructure and human health and safety by (1) damaging levees that protect residential and municipal areas; (2) damaging irrigation dikes, ditches, or impoundments that carry water throughout the state; (3) obstructing culverts under roads/railways, which undermines the roadbed; (4) creating dams that threaten or cause flooding of roads and/or residential areas; (5) creating open water on and adjacent to airports, which attracts ducks, geese, and other birds that increase the hazard of birdstrikes; (6) creating open water adjacent to residential areas, which promotes breeding of the mosquito vector of the West Nile Virus, a potentially fatal infection in humans; and (7) damaging public utilities such as electrical, storm-water, and wastewater treatment facilities. Approximately 96% of the beavers lethally removed by WS-California in the past five calendar years were for the protection of human health and safety and infrastructure. Burrowing animals can present a significant threat to levee integrity; therefore, proactive animal control and damage repair is required (CDWR 2012). As an illustrative example of the extent of damage beavers can cause, the California Department of Water Resources (CDWR) attributed the catastrophic 2004 Jones levee breach to beaver burrowing. Damage from this breach was estimated at $90 million (Suddeth et al. 2008).

With respect to damage by muskrats, their burrowing causes damage to dikes, ditches, and impoundments, preventing water conveyance for human drinking water and production of agriculture. Nutria pose a triple threat to California's resources: they threaten agriculture, they destroy critical wetlands needed by native wildlife, and they pose a public safety risk, as their destructive burrowing jeopardizes the state's water delivery and flood control infrastructure.

The California Department of Fish and Wildlife (CDFW) is the regulatory agency tasked with managing California's wildlife, including aquatic mammals. Beavers and muskrats are designated as fur-bearing mammals under California law (Cal. Fish & G. Code § 4000). Muskrats that are injuring growing crops or other property can be taken at any time and in any manner authorized by California law (Cal. Fish & G. Code § 4152(a)), but CDFW must issue a permit to the land/resource owner to take beaver that are either threatening to damage or destroy or actively damaging or destroying land or property (Cal. Fish & G. Code § 4181(a)). California regulations currently require that all furbearing and nongame mammals that are legally trapped be immediately killed or released on site (Cal. Code Regs. tit.14 § 465.5(g)(1)). Because the activities of beavers can create conflict with wildlife, agriculture, infrastructure, or human safety, CDFW does not issue permits for the relocation of beavers in California (CDFW 2019). Nutria are an invasive species in California and the California Department of Food and Agriculture (CDFA) defines them as an A-rated Agricultural Pest (Kratville 2017). Both CDFW and CDFA have developed statewide action plans for the eradication of nutria.

During the pendency of this consultation with NMFS, WS-California will operate in compliance with Section 7(d) of the ESA. Section 7(d) does not prohibit each and every commitment of resources, only those that are irreversible or irretrievable that would have the effect of foreclosing the formulation or implementation of reasonable and prudent alternative measures. In evaluating the potential effects of WS-California's aquatic mammal damage management activities in California, we have reviewed, among other things, a recent Biological Opinion (Washington BO) considering the potential effects of WS-Washington's aquatic mammal damage management activities on salmonids in Washington State (NMFS 2019).

WS-Washington and WS-California respond to similar requests for assistance with aquatic mammal damage. Both WS-Washington and WS-California use the same array of tools, lethal and non-lethal, when responding to those requests and follow the same Decision Model (WS Directive 2.201) in selecting the appropriate tool for responding to the damage incident at issue. Although WS-Washington's consultation with NMFS addressed different designated runs of coho, chinook, and steelhead, these same T&E species will be addressed in WS-California's consultation with NMFS and the description of habitat elements and life cycles are consistent across the runs of each species. In the effects section of the Washington BO, NMFS found no direct effects on salmonids from WS-Washington's actions or equipment. The balance of the BO focused on the potential for aquatic mammal damage management activities to cause indirect effects on salmonids through changes in water abundance or habitat character at fish rearing sites as a result of potential decay of beaver dams (NMFS 2019). We used information and analysis from the Washington BO to examine the potential effects of WS-California's activities and make informed decisions with respect to our activities pending completion of consultation.

In accordance with Section 7(d), pending the completion of the consultation and out of abundance of caution, WS-California has ceased the following aquatic mammal damage management activities that have potential to affect water abundance or habitat character at fish rearing sites within ESA listed salmonid habitat (i.e., designated critical habitat or other habitat occupied by the above-listed salmonids, sturgeon, and eulachon):

1. Lethal beaver damage management in natural rivers and streams, except as noted below in subparagraphs (e), (f), (g), and (i);
2. Debris management, including dam removal, except where it constitutes an obstruction to fish passage, as described in subparagraph (i), or if there is an imminent threat to public safety, as described in subparagraph (e); and
3. Implementation of certain non-lethal methodologies (i.e. pond levelers, flow devices, etc.) that may impact water abundance or site character at fish rearing sites for the aforementioned T&E species.

WS-California ceased these activities, in part, because NMFS' analysis in WS-Washington's BO indicated that these activities have the potential to affect salmonids.

WS-California will continue with a subset of its aquatic mammal damage management activities in California, described below. WS-California notes that the same activities were recently reviewed by NMFS in the Washington BO and found to be "not likely to injure, harm, or reduce the fitness of any individual salmon, steelhead, or critical habitat" (NMFS 2019). Additionally, NMFS in the Washington BO found that these same activities would not jeopardize the continued existence of any listed species nor would they destroy or adversely modify designated critical habitat. WS-California has reviewed its own activities in that context and similarly finds that such activities will likewise not rise to the level of jeopardy of listed species or adverse modification to designated critical habitat. For this reason, pursuant to the ESA, reasonable and prudent alternative measures are not required. *See* 16 U.S.C. § 1536(b)(3)(A) (explaining that reasonable and prudent alternative measures are necessary only after NMFS (or U.S Fish and Wildlife Service) determine that a proposed action is likely to result in jeopardy or adverse modification). Therefore, WS-California's activities will not violate Section 7(d) because they will not make an irreversible or irretrievable commitment of resources that would foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of the T&E salmonids and other T&E anadromous fish species considered as part of the initiated consultation with NMFS. Specifically, WS-California will continue to engage in the following activities:

a) Technical assistance to land owners. Technical assistance consists of WS-California personnel providing information, demonstrations, and advice on legally available and effective integrated wildlife damage management techniques to land owners for their implementation. Technical assistance may include demonstrations on the proper use of management devices (e.g., suitcase traps, cage traps, etc.) and information and advice on exclusion, habitat management, and animal behavior modification. Because the land owner would be responsible for implementation, WS-California would not be impacting any of the listed salmonids, sturgeon, or eulachon, or their critical habitats;

b) Non-lethal assistance (i.e., exclusion and limited relocations of beavers as directed by CDFW) to land/resource owners in managing aquatic mammal damage. No substantive differences exist between the way WS-Washington conducts non-lethal assistance and the way WS-California conducts it. For this reason, WS-California's continuation of non-lethal assistance will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, steelhead, sturgeon, or eulachon, or their critical habitats;

c) Nutria damage management, including the lethal removal of nutria. Nutria are a non-native, invasive species that state agencies are trying to eradicate.

Nutria severely damage wetlands by consuming copious amounts of native vegetation. Native plants are critical for the preservation of wetland soils and for the survival of native wildlife species. Burrowing by nutria can cause increased water turbidity and soil erosion that could potentially result in the degradation of habitat for native fish species. Nutria also do not create habitat for any NMFS-listed T&E species in California. Therefore, their removal may be beneficial to all native species. For these reasons, WS-California's continuation of nutria damage management will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, or eulachon, or their critical habitats;

d) Muskrat damage management, including the lethal removal of muskrat. Muskrat do not cut down large woody debris nor create dams to affect the flow of water. Instead, muskrats create burrows in banks of streams or dike/levee systems, which do not beneficially affect habitat for any of the NMFS-listed T&E species in California. Because muskrat do not create structural elements or otherwise positively affect habitat for native fish, WS-California's continuation of muskrat damage management will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, or eulachon, or their critical habitats;

e) Aquatic mammal damage management, including lethal removal, in response to public safety incidents declared by a regulatory or enforcement agency. In situations where human health and safety is at risk, such as levee burrowing, road flooding, or animal aggression (CDFW 2015 and CDFW 2019), WS-California works with other management agencies including the California Department of Water Resources (CDWR), California Department of Transportation (Cal Trans), county road departments, and city maintenance yards to alleviate the threat as quickly as possible. Time may be of the essence in instances where wildlife present an immediate threat to human health and safety; moreover, the choice of method that can be employed may be limited by the speed at which it can be implemented;

f) Beaver damage management, including the lethal removal of beaver, for the protection of T&E species and at conservation and habitat restoration sites at the request of the U.S. Fish and Wildlife Service (USFWS), CDFW, or other land manager. When beavers cut down trees and shrubs that were planted to restore the riparian zone, their actions are damaging the development of wetland conditions that benefit listed salmonids, other T&E species, and native species. WS-California's continuation of beaver damage management at these sites will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, or eulachon, or their critical habitats because, in these circumstances, the beaver are hindering habitat improvement efforts that could benefit them;

g) Beaver damage management, including the lethal removal of beaver, in locations where beavers cannot build dams, either due to topography or recurring removal of debris by another entity (i.e., lakes, rivers too wide to be dammed, and leveed rivers or channels managed for continuous water flow by resource managers/owners). WS-California acknowledges that when beavers create dams in natural stream habitat that can support pond development, the dam may benefit salmonids if the upstream pond created has improved habitat characteristics for fry rearing as compared to the preexisting stream habitat. However, dam dependent beneficial effects do not develop where dams cannot be built due to a channel's width, depth, or peak or constant water flows. Additionally, even if WS-California stopped this type of beaver damage management, because of human health and safety concerns, such activities would continue to be carried out by trained state/county/municipal agency staff or private companies due to the floodway management responsibilities of the state agencies and municipalities. For these reasons, WS-California's continuation of beaver damage management at locations where beavers cannot build dams will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, or eulachon, or their critical habitats;

h) Beaver damage management, including the lethal removal of beaver, in locations outside of the critical habitat of listed salmonids, sturgeon, and eulachon. The NMFS-listed T&E species cannot access certain water structures or waterways, such as man-made storm water/run-off structures, land locked lakes/ponds, river sections above dams or other impoundments that render the upstream portion inaccessible, and agricultural fields and irrigation systems. Because the T&E species are not present, they cannot benefit from beaver activity. For these reasons, WS-California's continued beaver damage management in such locations will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, or eulachon, or their critical habitats; and

i) Beaver damage management, including the lethal removal of beaver, at locations where beavers have blocked culverts, water control boxes, or other transportation crossings, to the extent that fish passage is prevented. Anadromous fish hatch in freshwater environments, spend most of their adult lives at sea, and return to fresh water years later to spawn. This life cycle is highly dependent on unobstructed waterways used as migration corridors. Improperly located, installed or maintained stream crossing structures, primarily culverts, can restrict fish movement and adversely affect fish populations. Debris blockages are among the most common fish passage obstructions at stream/road crossings. Alleviation of these blockages would likely benefit NMFS-listed T&E species by providing access to upstream habitat used for spawning and rearing. Additionally, even if WS-California stopped this type of beaver damage management, such activities would continue to be carried out by trained state/county/municipal agency staff or private companies due to the floodway management responsibilities of the state agencies and municipalities. For these reasons, WS-California's continuation of beaver damage management at these locations will not foreclose the formulation and implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, or eulachon, or their critical habitat.

WS-California uses a variety of non-lethal and lethal methods in managing damage by beavers, muskrat, and nutria (see description of methods in the attached project description sent to NMFS). WS-California personnel are highly trained and experienced in the use of these methods. They use their expertise and employ the WS Decision Model (WS Directive 2.201) to choose the appropriate method(s) in the given situation. WS-California personnel also comply with all applicable federal, state, and local laws and with WS Directives when using these methods. Additionally, WS-California personnel are trained to recognize the presence of, and potential risk to, non-target species, including T&E species, and take this information into account when selecting appropriate method(s). WS-California has no record of non-target take of Chinook Salmon, Coho Salmon, Steelhead, Green Sturgeon, or Pacific Eulachon using any of the methods described in the attached project description. The Washington BO found that the equipment used for managing aquatic mammal damage and site access by WS personnel were "not likely to injure, harm, or reduce the fitness of any individual salmon, steelhead, or critical habitat" and, therefore, not likely to result in jeopardy or adverse modification (NMFS 2019). WS-California uses the same equipment for aquatic mammal damage management as WS-Washington, with the exception of the foothold trap, which is prohibited in California. Based on this analysis, WS-California has determined that use of the methods described in the attached project description in managing damage caused by beavers, muskrat, and nutria will not make an irreversible or irretrievable commitment of resources that have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures for the protection of listed salmonids, sturgeon, and eulachon, or their critical habitats.

Based on the analysis above, it is my determination that that WS-California's continued aquatic mammal damage management activities, as described in subparagraphs (a) through (i) using the methods described in the attached project description, during the pendency of the consultation with NMFS initiated on March 12, 2019, is in compliance with Section 7(d) of the ESA. Such activities do not make an irreversible or irretrievable commitment of resources that would have the effect of foreclosing the formulation and implementation of any reasonable and prudent alternative measures for the listed salmonids, sturgeon, or eulachon, or their critical habitats.

Signed,

DENNIS ORTHMEYER

Digitally signed by DENNIS ORTHMEYER
Date: 2019.06.11 11:43:49 -07'00'

Dennis Orthmeyer
State Director, California Office
USDA APHIS Wildlife Services

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Effects of Wildlife Services Protection of SNBHS from Predation in California

(Deliberative Draft Document)

Prepared by:
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July 2021

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ACRONYMS

AVMA	American Veterinary Medical Association
BA	Biological Assessment
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CY	Calendar Year
ESA	Endangered Species Act
FR	Federal Register
IWDM	Integrated Wildlife Damage Management
MOU	Memorandum of Understanding
NPS	National Park Service
SNBS	Sierra Nevada Bighorn Sheep
USDA	United States Department of Agriculture
WS	Wildlife Services
WS-California	Wildlife Services-California

EXECUTIVE SUMMARY

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service, Wildlife Services (WS) in California (hereafter WS-California) conducts integrated wildlife damage management (IWDM) within the range of the Sierra Nevada bighorn sheep (*Ovis canadensis sierra;* SNBS). IWDM, such as the use of tracking and trailing hounds to locate predators, is conducted for the protection of SNBS from predators such as mountain lions (*Puma concolor*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and feral/free-ranging dogs (*Canis lupus familiaris*). This Request for a Letter of Concurrence (hereafter Request) addresses the possible effects of IWDM of predators on SNBS.

INTRODUCTION

Purpose of this Request

This Request evaluates potential effects of IWDM (resolving wildlife damage integrating the use of several management methods based on analysis of the situation and informed judgement of trained personnel) on federally listed SNBS under section 7 of the federal Endangered Species Act (ESA) of 1973, as amended. WS-California is the action agency and lead federal agency for this ESA consultation. WS-California uses lethal and non-lethal techniques to target individual predators that are known to be depredating on SNBS. This usually, but not always, entails capture and collaring of predators within SNBS range, and using radio telemetry and/or GPS locations to determine if a collared animal killed a bighorn sheep. These and other actions to protect SNBS from predation occur wherever SNBS are found in California. This project is anticipated to continue until SNBS are removed from the federal endangered species list. This Request and the findings are based on the best current data and scientific information available. Unless there is a need to prepare a new analysis, this consultation will be in effect for 10 years.

Consultation History

- On July 8, 2004, WS-California requested a formal section 7 consultation on all its programs and rescinded the prior requests for informal consultation. This request was later divided into two parts: Part I reviewed the program to protect threatened and endangered species from predation in California under formal consultation. Part II reviewed the IWDM program to protect livestock, human health and safety, property, and natural resources in the State of California under informal consultation.

- On April 6, 2009, WS-California requested formal section 7 consultation on its program to protect threatened and endangered species from predation. SNBS were included in this request.

Authorities

WS is authorized by Congress to protect American agriculture and other resources from damage associated with wildlife by providing assistance to agencies, organizations, and individuals in resolving wildlife conflicts. The Act of March 2, 1931 (46 Stat. 1468-69, 7 U.S.C §§ 8351-8352) states: "*The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program….*" The Act of March 2, 1931, as amended (7 U.S.C. § 8351 – Predatory and other wild animals and § 8352 – Authorization of expenditures for the eradication and control of predatory and other wildlife animals), authorizes the Secretary of Agriculture to conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary deems necessary in conducting the program. The Secretary of Agriculture has delegated this authority to Wildlife Services (WS Directive 1.210: Legal Authority). The Act was amended in 1987 (The Act of December 22, 1987 (Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 8353)) to further provide: "*On or after December 22, 1987, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control Activities.*"

PROJECT DESCRIPTION

Project Justification

SNBS were emergency listed as endangered under the ESA on April 20, 1999. Subsequently, in a final rule, they were federally listed as an endangered species under the ESA on January 3, 2000. The SNBS population has declined since the mid-1800s due to disease from contact with domestic livestock; predation from mountain lions, coyotes, and bobcats; availability of open habitat; and limited distribution (USFWS 2007). Due to their small population size, predation can be a limiting factor in SNBS recovery. It accounts for 54.5 percent of recorded SNBS deaths between 1975 and 2007, the majority of which is from mountain lion predation (USFWS 2008).

Project Location

The proposed project is in California anywhere IWDM is used in response to wildlife related damage within the range of the SNBS and WS-California actions to remove predators for the protection of SNBS. Sierra Nevada bighorn sheep occur in Tuolumne, Mono, Fresno, Inyo, and Tulare counties; however, most of the work has historically occurred in Mono and Inyo counties.

Wildlife Services-California Overview

WS is authorized and directed to resolve conflicts involving damage associated with wildlife, including animals preying on or harassing livestock and wildlife, damaging property, or threatening human health and safety. WS-California is a collection of cooperative programs with other federal, state, and local agencies, private individuals, and associations to protect livestock, poultry, natural resources (e.g., wildlife), property, and human health and safety from wildlife threats and damages. WS-California conducts technical assistance (education, information, and advice), and operational assistance (preventative and corrective) to achieve these goals. Operational assistance on public and private lands is conducted under memoranda of understanding (MOUs), cooperative agreements, or agreements for control. All IWDM is based on interagency relationships, which require close coordination and cooperation because of overlapping authorities and legal mandates.

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and control of damage caused by wildlife based on analysis and the informed judgment of trained personnel. The philosophy behind IWDM is to implement effective management techniques in a cost-effective manor while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. It may incorporate cultural practices (i.e. animal husbandry), habitat modification, altering animal behavior (i.e. harassment), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems. Consideration is given to the following factors before selecting or recommending control methods and techniques:

- species responsible for damage;
- magnitude, geographic extent, frequency, and duration of the problem;
- status of target and non-target species, including threatened and endangered species;
- local environmental conditions;
- potential biological, physical, economic, and social impacts;
- potential legal restrictions;
- costs of control options;
- what other strategies can be implemented if prevention efforts (non-lethal and lethal techniques) fail to stop damage.

Under the current program, WS-California receives requests for assistance from, and may enter into cooperative agreements with private landowners, livestock managers, Native American Indian tribal land managers, cooperating counties, Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service, California Department of Water Resources, California Department of Fish and Wildlife (CDFW), California Department of Food and Agriculture, and other federal, state, county, and municipal agencies/entities. Some of the methods used in the current program include but are not limited to: education about animal husbandry practices and cultural habits, tracking and trailing hounds, fencing recommendations, harassment, cage traps, padded-jaw foot-hold traps, snares, and shooting. These methods may be recommended by WS-California via technical assistance or implemented by WS-California via operational assistance. Most IWDM methods have recognized strengths and weaknesses relative to each specific predator damage situation. WS-California personnel can determine for each IWDM activity what method or combination of methods are most appropriate and effective by using the WS Decision Model (Figure 1; Slate et al. 1992). Several methods are available for consideration in the process. WS-California conducts direct control activities on lands where signed Work Initiation Documents for Wildlife Damage Management (formally called Agreements for Control on private/non-private Property) have been executed. These agreements list the intended target animals and methods to be used. In some cases, with public land agencies, a MOU serves as these Work Initiation Documents for control activities.

Types of Management Assistance

Technical Assistance

Technical assistance recommendations are the responsibility of the requestor to implement. WS-California personnel provide information, demonstrations, and advice on many of the available IWDM techniques. Technical assistance includes demonstrations on the proper use of management devices and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Deciding which recommendations to suggest to a requestor may require substantial effort by WS-California. Part of the decision-making process includes an on-site visit or verbal consultation with the requestor. Generally, several short and long-term management strategies are described. Because the requestor is primarily responsible for implementing these strategies, the recommendations are based on the abilities of the requestor, the level of risk, need, and practical application.

A wide range of management tools could be recommended by WS-California to alleviate wildlife damage, for landowner/resource managers to implement. Compliance with applicable federal, state, and local laws and regulations is the responsibility of the landowner/resource owner implementing the methods. Consequently, these methods are not included in this consultation and will not be discussed further because they are not implemented by WS-California personnel.

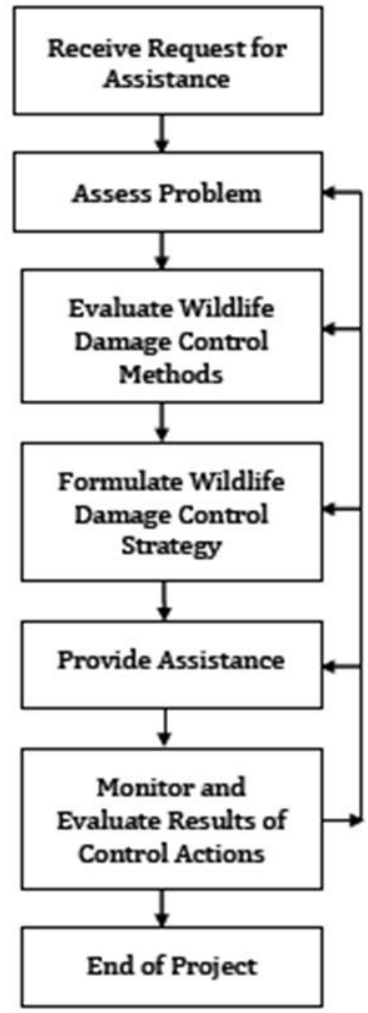

Figure 1. WS Decision Model (Slate et al. 1992)

Operational Assistance

Operational assistance includes activities conducted or supervised by WS-California personnel. Operational assistance is implemented when the problem cannot effectively be resolved through technical assistance and when Cooperative Agreements provide for WS-California operational assistance. The initial investigation defines the nature and history of the problem, extent of the damage, and the species responsible for the damage. The professional skills of WS-California personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or if the problem is too complex and requires the direct supervision of a wildlife professional.

WS-California considers the biology and behavior of the damaging species and other factors using the Wildlife Services Decision Model (Slate et al. 1992). The recommended strategy (ies) may include any combination of proactive and reactive actions that could be implemented by the requestor, WS-California, or other agencies, as appropriate. However, reactive management, that which is applied in response to a loss with the intent of abating or reducing further losses, is most often used. Proactive management, the application of damage management strategies prior to damage occurring, is applied less frequently, usually in areas with historical, chronic, damage problems.

INTEGRATED WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

Managing predation on SNBS involves the use of 1) cage traps, 2) foot/leg snares, 3) neck snares/Collarum™, 4) padded-jaw foot-hold traps, 5) tracking and trailing dogs, 6) firearms, and 7) immobilizing agents. Other IWDM methods could recommended by WS-California to resource owners to protect SNBS. In addition, WS-California is sometimes asked to investigate SNBS mortalities. WS-California sometimes monitors radio frequencies and GPS locations of animals collared by CDFW to locate both sheep and lions when conducting activities for this project. To access the sites to perform activities on this project, WS-California personnel use vehicles (defined as 4-wheel drive or all-terrain vehicle for this Request), horses/mules (hoof stock), or enter the area on foot. Sites may be accessed any time of the year, with most of the work focused on the spring through fall months.

Non-lethal Methods

Non-lethal methods used to in the management of SNBS predators are tracking and trailing dogs, padded-jaw foot-hold traps, neck snares/Collarum™, cage traps, and drug delivery devices. Some capture devices, such as snares, can be both non-lethal and lethal depending on how the device is set. After capture the animal can either be released on site or euthanized. Predators that are captured can be fitted with telemetry collars, allowing for tracking after release. Relocation is also an option; however, it is not performed by WS-California. Any relocations are performed by CDFW with WS assistance limited to locating and capturing lions.

Relocation is the translocation of an individual that is causing damage from the area to an area where it will hopefully not be able to continue problematic behavior. While relocation is a non-lethal option, WS-California typically does not relocate predators that are creating a predation threat to SNBS. In addition, translocation of wild animals is discouraged by WS policy (WS Directive 2.501, USDA 2018) because of stress to the relocated animal and poor survival rates due to intraspecific strife with established resident animals of the same species, and because of difficulties in adapting to new locations or habitats.

Capture Methods

Live capture methods are used to capture individuals causing damage. They include methods such as cage traps, snares, and padded-jaw foot-hold traps. Most of these traps are set to capture and hold the animal alive until personnel arrive. The animal can be euthanized or released as appropriate.

Cage Traps

Cage traps are non-lethal capture devices. The size of the cage trap depends on the size of the targeted species; this helps limit the capture of non-target species by physically excluding them from the trap. Traps are set near signs of damage (deceased SNBS), or in areas where the target species is known to travel and are usually baited with species-specific baits. Cage traps set by WS-California personnel are checked daily by WS-California personnel, the landowner/manager, or their designated agent. Non-target animals can usually be released with little or no injury. Target animals may be euthanized, released on site, or relocated. Cage traps used to capture mountain lions are typically constructed of commercial livestock panels made of 3/16" galvanized welded rods. The top, sides, front, and bottom panels are welded together, and panel openings are approximately 2"x4". These cage traps may have a treadle type trigger and a single-catch, multi-catch, or gravity door.

Large cage traps are occasionally used by WS-California to capture bobcats and feral dogs. WS-California defines large cage traps as being larger than 12"x12"x36", but not culvert traps. Large cage traps vary in size and shape depending on the species being targeted. Bobcat or dog-size cage traps are made of welded wire, utilize a treadle type trigger system and close with a spring or gravity door.

Snares

Depending on how and where snares are set, they can be used for live-capture and release, holding for subsequent euthanasia, or for a direct kill. Snares are made of strong, lightweight cable, wire, or monofilament line with a locking device, that capture animals by the neck, body, or foot. Snares can also be built with either a breakaway feature to release non-target wildlife that are considerably larger than the target species or a stop device that prevents the snare from closing on a smaller non-target wildlife. Snares can be used effectively on animal travel corridors, such as under fences or trails through vegetation. Snares offer several advantages over foothold traps (described below) because they are lighter to transport or carry and not as affected by inclement weather.

When an animal steps into the cable loop placed horizontally on the ground, a spring is triggered, and the cable tightens around the foot to hold the animal. If the snare is placed vertically, the animal walks into the snare and the neck or body is captured or entangled. On standard cable snares, snare locks are typically used to prevent the loop from opening again once the loop has closed around an animal. Loop stops can also be incorporated to prevent the loop from either opening or closing beyond a minimum or maximum loop circumference, which effectively excludes non-target animals, such as Sierra Nevada Red Fox (*Vulpes vulpes necator*), or allows for live capture of target animals.

Most snares are also equipped with a swivel to minimize injuries to the captured animal and reduce twisting and breakage of the snare cable. Breakaway devices can also be incorporated into snares, allowing the loop to break open and release the animal when a specific amount of force is applied. These devices can improve the selectivity of cable restraints to reduce capture of non-target species.

The Collarum™ is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes. The trigger is designed specifically for canines, which use a distinct pulling motion to set off the device. The device uses an attractant and is activated when an animal bites and pulls a cap. The snare is then projected from the ground up and over the head of the coyote. A stop on the device limits loop closure and prevents capture of smaller non-target wildlife. As with other types of snares, the use of the Collarum™ device to capture coyotes is greatly dependent upon finding a location where they frequently travel.

Padded-jaw Foot-hold Traps

Padded-jaw foot-hold traps are two coil spring traps with rotating jaws. They have centrally attached inline shock springs, swivels to allow for movement, and are equipped with non-hardening rubber on the face of the jaw. These traps come in several sizes depending on the target species. Padded-jaw foot-hold traps are designed to close on an animal's foot and hold the animal without injuring it. They have adjustable pan tension triggers which allow the exclusion of animals smaller than the target species. These traps can be used for live-capture and release or hold for subsequent euthanasia. Padded-jaw foot-hold traps usually permit the release of non-target animals unharmed.

Traps are placed in the travel paths of target animals and some are baited or scented, using an olfactory attractant, such as the species' preferred food, urine, or musk/gland oils. The use of baits also helps to facilitate the prompt capture of target predators. This often decreases the total time traps are in the field, thereby lowering risks to non-target animals. In some situations, a draw station—a carcass, or large piece of meat—is used to attract target animals. In this approach, one or more traps are placed in the vicinity of the draw station. WS Directive 2.450 prohibits the placement of traps closer than 30 feet to the draw station to reduce the risk to non-target animals (USDA 2018).

Padded-jaw foot-hold traps set for mountain lions, bobcats, and feral dogs are set with dirt or debris (e.g., leaf litter or rotting wood) sifted on top. The traps can be staked to the ground securely, attached to a solid structure (such as a tree trunk or heavy fence post), or used with a drag that becomes entangled in brush to prevent the trapped animal from escaping. Anchoring systems should provide enough resistance that if a larger animal is unintentionally captured, it should be able to either pull free from the trap or be held to prevent escaping with the trap on its foot.

Effective trap placement also contributes to trap selectivity. To minimize risk of capturing non-target animals, the user must be experienced and consider the target species' behavior, habitat, environmental condition, and the habitats of non-target animals. The pan tension, type of set, and attractant used greatly influence both capture efficiency and risks of catching non-target animals. The level of trap success is often determined by the ability of the user, through training, skill, and experience, to adapt the trap's use for specific conditions and species. WS-California personnel check these traps daily and follow state laws and regulations regarding the setting and checking of traps and snares per WS Directive 2.450 and 2.210 (USDA 2018).

Padded foot-hold traps can be used in California for the protection of threatened and endangered species (In Nat. Audubon Society v. Davis (N. D. Cal. 2000) 144 F. Supp. 2d 1160, the United

States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of this method for the protection of threatened and endangered species.). Target animals may be euthanized, released on site, or relocated; non-target species may be released on site.

Trained Dogs

Trained dogs are used to trail certain species, identify sites to set equipment where target wildlife might be travelling, to tree specific species of wildlife for capture or removal, and as a decoy to draw target species closer for shooting activities. In order to stop the potential spread of diseases from the tracking and trailing hounds to wildlife all hounds will be vaccinated for Canine Distemper, Canine Adenovirus type 1 and 2, Canine Parainfluenza, Canine Parvovirus and 4 types of Leptospira (*L. canicola, L. grippotyphosa, L. icterohaemorrhagiae, & L. pomona*) using a commercially available combination vaccination.

- *Decoy dogs* are sometimes used to lure coyotes within shooting distance. These dogs are kept under control of personnel and are unlikely to interact with wildlife.

- *Detection dogs* are used to identify sites where equipment may be effective by indicating where mountain lions, bears, coyotes, or other predators have traveled, urinated, or defecated. They are kept under the control of personnel and are unlikely to interact directly with wildlife.

- *Trailing dogs* are used by WS-California to trail mountain lions, feral swine, and black bears. Dogs are trained to find and follow the scent of the target species. The dogs are tracked with GPS collars and stay with the animal until WS-California personnel arrive and then anesthetize, dispatch, or release it, depending on the situation. For instance, WS-California personnel assist CDFW by collaring mountain lions with new radio telemetry collars, replacing old collars, and monitoring collared mountain lions using dogs. Dogs are trained to ignore the scents of non-target species.

Chemical Immobilization

Chemical immobilization is the use of drugs such as telazol and ketamine/xylazine to restrain wildlife to allow for activities such as collaring and sample collection. This process can be dangerous both for personnel and the animal and requires training and experience.

These immobilizing agents produce central nervous depression through various means and render the animal unconscious. They are delivered to the target animal with a dart gun, blow gun, or syringe pole depending on the circumstances and the species being immobilized. If the agents are delivered via a dart, the dart is retrieved if possible. For this project, the animal is typically treed with dogs or physically restrained by a trap and then the drug is delivered to the animal.

Once the procedures are completed the animal is monitored until it is recovered. For some of the immobilizing drugs, this means allowing the drugs to work through the animal's system. For others, there are antagonists that can be given that reverse the effects of the immobilizing drug such as yohimbine for xylazine.

Lethal Methods

Lethal methods are often most appropriately used by trained and certified WS-California personnel. The use of firearms, often in conjunction with other methods is the most frequently used method in the protection of SNBS. Methods used to capture predators prior to lethal removal by firearm include tracking and trailing dogs, cage traps, foot/leg snares, and padded-jaw foot-hold traps.

Shooting

Firearms are used to selectively remove individual animals. Shooting to selectively remove individual animals is a very specific method and a properly placed gunshot can cause immediate insensibility and a humane death (AVMA 2020). WS-California personnel kill animals as quickly and humanly as possible; under some conditions a gunshot may be the only practical method of euthanasia (AVMA 2020). This method is selective for target species. All applicable firearm safety precautions, laws, and regulations governing the use of firearms are followed by WS-California when conducting IWDM activities. To ensure WS-California employees receive uniform firearms safety training, National Rifle Association (NRA) certified instructors and the NRA's curriculum for the basic pistol, rifle, and shotgun certifications are the officially recognized program for initial WS-California firearms safety training. WS-California personnel will receive updated training per the WS Firearms Safety Training Manual. More detailed information on WS-California firearm use, training, and storage can be found in WS Directive 2.615: WS Firearm Use and Safety. WS-California personnel commonly use firearms in combination with other techniques and/or modifications listed below.

- *Calling* consists of using voice, mouth, handheld, or electronic calls to draw predators into the area. Calling is often used to draw the target species into firearm range.

- *Night shooting* may be conducted with spotlights or night vision devices. Night vision devices are undetectable to the surrounding environment. Spotlights are high intensity lights that are used to identify and cause the target species to temporarily pause its movements and/or flush when exposed for a length of time.

- *Non-lead (non-toxic) ammunition* (including shot and pellets) is used on this project. Effective July 1, 2015, California state law (AB711) and subsequent regulations promulgated by the California Fish and Game Commission require the use of nonlead ammunition in a phased approach when taking wildlife for recreation or depredation purposes. Effective July 1, 2019, nonlead ammunition is required for the taking of any wildlife for any reason. WS-California has preemptively made a transition to using nonlead ammunition when controlling wildlife. As such, only nonlead ammunition is used, and will be used, when taking wildlife on this project. More information on the regulations and phased approach can be found at https://www.wildlife.ca.gov/Hunting/Nonlead-Ammunition.

- *Suppressors*. Firearms create high intensity sound for short durations. When possible, without reducing the effectiveness of the methods, WS-California use suppressors (silencers) and specific ammunition (subsonic) to minimize the audio report of firearms. Suppressors and subsonic ammunition are most used with rifles. Shotguns cannot always be suppressed without affecting shot pattern and/or shooting accuracy.

Site Access

Before WS-California conducts any wildlife damage management, a request must first be received, and *Work Initiation Documents for Wildlife Damage Management* must be signed by the landowner/administrator for private lands or other comparable documents for public or tribal lands must be in place. WS-California uses 4-wheel drive vehicles, all-terrain vehicles (ATVs), or hoof stock for conveyance when conducting IWDM activities. When operating on federally or state-owned lands, all WS-California compliance terms and conditions are set forth in WS-California MOUs with land management agencies. In addition to vehicles and personnel, dogs are regularly used for field work on this project. WS personnel working on the project will be limited to three staff, and no more than 10 trained dogs.

Target Animals

In the Sierra Nevada, mountain lions are the primary predator of adult SNBS, accounting for 96 percent of losses attributed to predation with the remaining losses attributed to coyotes and bobcats (USFWS 2007). From 1975 to 2000, predation accounted for at least 54.5 percent of 147 SNBS deaths (USFWS 2007). This percentage could be considerably higher because the cause of many mortalities is unknown (USFWS 2007). Following the federal emergency endangered listing in 1999, the CDFW initiated a program of focused control on mountain lions.

In 2000, the CDFW began placing telemetry collars on mountain lions near the ranges of SNBS. The CDFW contracted with WS-California to capture mountain lions for collaring/recollaring or for euthanasia in SNBS range. In addition, WS-California assists the CDFW by tracking mountain lions and SNBS as well as investigating bighorn sheep mortalities. From calendar year (CY) 2003 through 2020, WS-California lethally removed a total of 16 mountain lions that were known to be depredating upon SNBS and immobilized 106 mountain lions for collaring/recollaring to assist with monitoring (Table 1). This data is provided to CDFW, upon request, for inclusion into annual CDFW SNBS reports. Nineteen mountain lions were captured and released without immobilization due to conditions being unsafe for immobilization.

Additionally, three kittens were hand captured and samples were collected before they were released. Two lions were killed in an altercation with dogs. These animals were associated with a female that was preying on SNBS and identified for lethal removal. Efforts were made to determine if she had dependent young prior to her capture. The last attempt to verify her reproductive status was to capture and verify if she was lactating. It was discovered after the capture that she had young associated with her that had been killed in an interaction with the dogs. This is a very unusual occurrence.

Table 1. Target species taken for Sierra Nevada bighorn sheep protection from CY 2003-2020 (USDA 2021).

Target Species	Capture Method	Immobilized	Released*	Killed/Euthanized**
Mountain lion	Dog	82	19	16
	Cage Trap	17	1+	0
	Hand caught/gathered ***	0	3	0
	Telemetry	1	0	0
	Foot/leg snare	6	0	2
Bobcat	Dog	1	0	0
	Foot/leg snare	1	0	0

*Lion released without immobilization.
**Lion typically euthanized with a firearm after capture. However, two young animals were killed in an altercation with dogs.
***Three kittens were found using the GPS location of a collared mountain lion. WS-California collected hair from kittens.
+Cats disposition was Transfer of Custody (T.O.C.) to CDFW, not released at the capture location.

The number of mortalities of collared SNBS from mountain lion predation appears to be increasing (Table 2). During the winter of 2016-17, two mountain lions were lethally removed in response to heavy predation on female sheep in the Mount Langley herd. WS-California anticipates that the CDFW will request assistance in the protection of SNBS from mountain lions and other predators (bobcats, coyotes, feral/free-ranging feral dogs) that are known to be depredating on bighorn sheep.

Table 2. Number of SNBS mortalities caused by mountain lion predation (CDFW 2013, CDFW 2014, CDFW 2015, CDFW 2016, CDFW 2017, CDFW 2018, and T. Stephenson, in lit 2021, pers comm).

Bighorn Sheep Year (May 1 – April 30)	Number of Mortalities from Mountain Lion Predation
2012-2013	4
2013-2014	2
2014-2015	5
2015-2016	17
2016-2017	32
2017-2018	11
2018-2019	13
2019-2020	20

PROTECTED SPECIES INFORMATION

Sierra Nevada Bighorn Sheep

Listing

SNBS were emergency listed as endangered under the ESA on April 20, 1999 (64 Federal Register (FR) 19300). On January 3, 2000 they received the final listing of endangered under the ESA (65 FR 20).

Habitat

SNBS avoid forests and thick brush but will use open woodland habitats on rocky slopes (USFWS 2008). Large expanses lacking precipitous escape terrain, such as Owens Valley, are substantial barriers to movement (USFWS 2008). Their habitat is patchy, and the population structure is naturally fragmented (USFWS 2008). SNBS utilize a wide range of elevations, from alpine peaks more than 13,120 feet to the base of the eastern escarpment as low as 4,760 feet (USFWS 2008). Within this elevation range there is a wide variety of vegetation communities, including (from lowest to highest): 1) Great Basin sagebrush-bitterbrush-bunchgrass scrub; 2) pinyon-juniper woodland and mountain mahogany scrub; 3) mid-elevation and subalpine forests, woodlands, and meadows; and 4) alpine meadows and other alpine habitats varying from cliffs to plateaus (USFWS 2008).

Population Decline and Recovery Efforts

The total population of SNBS prior to settlement is unknown, but it probably exceeded 1,000 individuals (USFWS 2007). Population losses began shortly after the immigration of Europeans to the Sierra Nevada in the mid-1800s and those losses continued through most of the twentieth century (Wehausen et al. 1987). Specific causes of most population losses are unknown; however, market hunting for mining towns and disease die-offs from contact with domestic sheep are considered to be the primary causes of population decline (USFWS 2008). A die-off in the 1870s, west of the Kern River, was attributed to scabies (Jones 1950), presumably from contact with domestic sheep. Additionally, die-offs from pneumonia contracted from domestic sheep may have also contributed to population decline; this has not been documented in SNBS but has occurred in other bighorn sheep subspecies.

By 1978, three herds totaling 250 animals were all that remained of the SNBS and that number reflected an apparent recent population increase from much lower numbers (NPS 2018). Biologists successfully reintroduced three herds during 1979-88 and under the guidance of the Sierra Nevada Bighorn Sheep Interagency Advisory Group, released 27 bighorn sheep in Lee Vining Canyon, east of Tioga Pass, in 1986 (NPS 2018). Overall, these fledgling bighorn sheep herds initially lost numbers, in part due to mountain lion predation, until the trend was reversed by the addition of 11 bighorn sheep to Lee Vining Canyon and the initiation of mountain lion control in 1988. Those efforts worked and by 1994 the total population was approaching 100 animals with a reproductive base of about 50 females (USFWS 2008, NPS 2018).

However, bighorn sheep began to increasingly avoid using low-elevation winter range in Lee Vining Canyon, where mountain lion control ceased after a state initiative in 1990 made mountain lions a specially protected mammal (NPS 2018). Wehausen (1996) suggested that this change in habitat selection was a response to increased mountain lion predation on low-elevation winter ranges. The winter of 1994-95 proved to be devastating for some SNBS herds that appeared to be avoiding mountain lion predation on lower elevation winter ranges by attempting to live year-round at high elevations (NPS 2018). As a result, SNBS were emergency listed as endangered under the ESA on April 20, 1999, after which they were listed as a federally endangered species under the ESA on January 3, 2000. The federal designation was vital in allowing control of mountain lion predation on SNBS (NPS 2018).

Those losses were thought to be a key factor that put these sheep in danger of extinction (USFWS 2008). However, new research by Spitz (2015) indicates that SNBS exhibit two different migratory strategies during the winter months. SNBS may move to lower elevations or remain at high elevations during the winter. For example, SNBS in the Mount Gibbs Herd Unit remain at high elevation year-round and have one of the highest survival rates (Stephenson et al. 2012).

In September 2007, the USFWS and the CDFW jointly approved the Recovery Plan for the SNBS (Recovery Plan; USFWS 2007). The Recovery Plan identified 16 herd units throughout the range of the species. These herd units are either currently occupied by SNBS or have habitat characteristics conducive to future population establishment. The Recovery Plan identified 12 of the 16 herd units as essential for recovery. Three natural breaks in the distribution of the herd units separate them into four distinct recovery units: Kern, Southern, Central, and Northern.

As of 2018, there are at least 246 yearling and adult ewes (CDFW 2018; Table 3); this represents a minimum number as surveys are still ongoing. All 12 of the herd units considered essential for recovery remain occupied with the herds distributed throughout the four recovery units. The Recovery Plan identified a numerical goal of 305 yearling and adult females distributed across four recovery units (USFWS 2007).

Table 3. The minimum number of SNBS yearling and adult females located throughout essential herd units and recovery units (CDFW 2018,).

Recovery Unit	Herd Unit	Number of Ewes	Recovery Goals
Kern	Big Arroyo	9	50
	Laurel Creek	2	
Southern	Olancha Peak	22	155
	Mount Langley	26	
	Mount Williamson	15	
	Mount Baxter*	49	
	Sawmill Canyon	43	
	Taboose Creek	1	
Central	Wheeler Ridge*	45	50
	Convict Creek	5	
Northern	Mount Warren	5	50
	Mount Gibbs	24	
	Total	**246**	**305**

*2016 minimum counts

Reproduction and Survivorship

SNBS give birth—generally to a single lamb—during short periods in late spring and early summer with most births occurring in May and June (Wehausen 1980 and Wehausen 1996). The timing of births correlates with the nutritional regime of females; later birthing appears to be a consequence of lower annual nutrient intake (Wehausen 1996). The breeding season occurs during November and December, when the bighorn sheep are still at high elevations (USFWS 2008). Nutrient intake can influence birth rates, including the frequency with which adult females produce young and the age at which females first bear offspring (USFWS 2008). Two years of age is the youngest that females in the Sierra Nevada give birth and their age at first lambing might be as high as four years under poor nutritional circumstances, as has been recorded for Dall's sheep (*Ovis dalli*; Bunnell and Olson 1981).

Survivorship of lambs can also vary with environmental and nutritional factors (USFWS 2008). For the Mount Baxter and Sawmill Canyon herds in the Sierra Nevada during 1965-79, 73 percent of the variation in winter lamb to female ratios were explained by variation in precipitation eight to 12 months prior to conception (Wehausen 1980). That model suggested that variation in the production of young, rather than offspring survival, was the primary variable affecting winter recruitment ratios during that period (USFWS 2008). Lamb survival may also be sensitive to habitat use patterns (i.e. low-elevation winter range) and associated environmental factors (USFWS 2008).

Sierra Nevada Bighorn Sheep Critical Habitat

Critical habitat for SNBS was designated in 2008 (73 FR 45534). Twelve units/areas designated as critical habitat are: Mount Warren, Mount Gibbs, Convict Creek, Wheeler Ridge, Taboose

Creek, Sawmill Canyon, Mount Baxter, Mount Williamson, Big Arroyo, Mount Langley, Laurel Creek, and Olancha (73 FR 45534). Of the 417,577 acres of critical habitat, 416,407 acres are on federal land, 1,005 acres are on private lands, and 165 acres are on local government (state) land (73 FR 45534). Critical habitat occurs in Tuolumne, Mono, Fresno, Inyo, and Tulare counties. Critical habitat does not include manmade structures, airports, roads, and other paved areas, and the land on which they are located, existing on the effective date of this rule, and not containing one or more PBFs (73 FR 45534). At the time of critical habitat designation, seven of the 12 herd units were occupied by SNBS (73 FR 45534,).

The physical and biological features (PBFs) of SNBS are:

1. non-forested habitats or forested openings within the Sierra Nevada from 4,000 to 14,500 feet in elevation with steep (greater than or equal to 60 percent slope), rocky slopes that provide for foraging, mating, lambing, predator avoidance, and bedding and that allow for seasonal elevation movements between these areas;
2. a variety of forage plants as indicated by the presence of grasses (e.g., *Achnanthera* spp.; *Elymus* spp.) and browse (e.g., *Ribes* spp.; *Artemisia* spp., *Purshia* spp.) in winter, and grasses, browse, sedges (e.g., *Carex* spp.) and forbes (e.g., *Eriogonum* spp.) in summer; and
3. granite outcroppings, containing minerals such as sodium, calcium, iron, and phosphorus that could be used as mineral licks in order to meet nutritional needs (73 FR 45534).

MINIMIZATION MEASURES

WS-California has established the following conservation measures to minimize risks to SNBS when conducting predator IWDM to protect.

- Tracking and trailing dogs are trained by WS-California not to pursue species other than the targeted species (usually mountain lions).
- Houndsman will be trained in safe restraint and handling protocols, capture, collaring, and collection of scientific biological data.
- Houndsman will have and use only specialized dogs to find, follow by scent, track by sign, tree, bay up in rocks mountain lions, bobcats, and other potential species that may depredate on SNBS. When capture occurs, the individual will be either anaesthetized, dispatched, or released depending on the situation and established protocols which may include assisting in capturing and collaring of mountain lions with new radio telemetry collars, replacing old collars, and monitoring collared mountain lions using dogs.
- Snares and Collarum™ devices will be equipped with either a breakaway feature or a stop device depending on the species targeted and non-target animals that may be found in the area. Use of a stop and/or breakaway and field placement of equipment will minimize impacts to non-target animals
- The locations of groups of sheep are monitored by WS-California and CDFW personnel. Personnel will remain in regular communication with partner agencies and other entities keeping track of the locations of SNBS herds to ensure that management activities account for SNBS presence when necessary. These locations are shared and taken into consideration when planning and

conducting field activities. Some of the activities conducted for this project bring personnel into the vicinity of sheep, such as capture, or the investigation of sheep mortalities; however, field work in proximity to sheep is avoided unless there is a specific reason to be in the area.

EFFECTS OF THE PROPOSED ACTION

The effects of the action are all consequences to listed species that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02, as amended August 27, 2019).

Effects of Proposed Action on Sierra Nevada Bighorn Sheep

WS-California's actions to remove predators of SNBS should have a moderate beneficial impact on SNBS. The removal of mountain lions and to a lesser degree bobcats, coyotes, and feral dogs would help slow and reverse SNBS population declines and contribute to the long-term survival and recovery of bighorn sheep.

WS-California would use cage traps, foot/leg snares, neck snare/Collarum™, padded-foot-hold traps, tracking and trailing dogs, firearms, GPS/VHF collar frequency monitoring, and immobilizing agents to protect SNBS from mountain lion, bobcat, coyote, and free-ranging/feral dog predation. The benefit to SNBS from removing mountain lions has been demonstrated in Lee Vining Canyon where a restoration program was threatened by mountain lion predation. The removal of one mountain lion in each of three consecutive years reversed the trend and the bighorn sheep population increased rapidly (Chow 1991).

It is possible that a SNBS could be caught in a trap or snare set for a predator. The possibility of such an event is extremely low for the following reasons: 1) traps and snares are infrequently used; 2) bighorn sheep will not be attracted to the traps or snares because they are baited with meat based products or urine; and 3) bighorn sheep do not frequent densely vegetated areas where the traps and snares are located (USDA 1999); 4) foot-hold trap and snare design allows SNBS to pull the foot from the trap or to break the snare.

Dogs used to track mountain lions do not pose a direct threat to threatened or endangered species because they are trained to trail only the target animal (USDA 1999). The use of trained dogs, especially for trailing, has the potential to cause minor disturbance and an insignificant change in behavior of SNBS if hounds are chasing a lion in the vicinity of SNBS. Trailing hounds are trained by the handler to ignore nontarget species but their presence, while temporary in nature, may cause disturbance. Minimizing measures would limit exposure to this activity to SNBS with previously unknown locations, which includes SNBS without collars and those with non-functional collars.

Firearms use is species specific and will not pose a threat to threatened or endangered species as they are not the target. Similarly, chemical immobilization is used only when the animal is identified as the target. On this project, species targeted with chemical immobilization are predators of SNBS, not the sheep themselves.

Effects from Site Presence

WS California personnel are in close communication with SNBS recovery personnel keeping close track of SNBS locations to avoid any unnecessary disturbance. WS-California personnel access the sites with four-wheel drive vehicles, ATVs, hoof stock, and by foot. In addition, dogs used to track mountain lions and other predators could have an indirect effect of disturbing a group of sheep. However, WS-California's site presence is unlikely to have a significant negative impact on the SNBS population.

Groups of sheep are tracked, and location information is shared with WS-California personnel. This allows personnel to avoid sheep during field activities if possible. In addition, areas typically inhabited by sheep are difficult to access, which limits field work in these areas. Any disturbance of sheep will be discountable as the types of field work that requires WS-California personnel to be in the vicinity of an individual or group of sheep are limited to the minimum amount of time necessary

Critical Habitat Effects

WS-California's IWDM activities generally have no effect on critical habitat because:

- the proposed action does not destroy or adversely modify critical habitat.
- soil disturbance is minor and would rarely occur in undisturbed sites;
- ground disturbance is minimized because vehicles are used only on existing roads and trails to the extent practical (in some places required);
- most activities involve no ground disturbance, no vegetation is removed (or cut, altered or destroyed
- there is no construction proposed or major ground disturbance;
- setting traps involves only minor ground disturbance, equipment is set primarily in previously disturbed areas;
- coordination with land management agencies and landowners identifies sensitive areas to avoid.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future state, tribal, or private activities, not involving federal activities, which are reasonably certain to occur within the action area of the federal action considered in this Request. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The following future, state, tribal, local, or private actions may affect the SNBS and result in direct SNBS mortality: habitat loss and fragmentation, reduction of habitat suitability, human induced mortality from vehicle strikes or other types of accidental take, and illegal take (poaching) of SNBS.

EFFECTS DETERMINATIONS

Actions to monitor and remove predators of SNBS should have a moderate beneficial impact on SNBS populations in those areas. At the time of its listing, mountain lion predation was considered one of the primary threats to SNBS; and it is likely that selective mountain lion removal has contributed to the return of several herds to their winter ranges (USFWS 2008).

Some of the WS-California actions for this project require access to areas inhabited by SNBS by vehicle, hoof stock, and on foot. In addition, trained dogs are used for many of the actions for this project. However, WS-California maintain close contact with recovery personnel who are keeping track of the locations of SNBS to avoid unnecessary disturbance of the sheep. WS-California has determined that its site access **May Affect, Not Likely to Adversely Affect** SNBS. WS-California has further determined that its IWDM activities (the use of cage traps, foot hold traps, leg snares, neck snares/Collarum™, trained dogs, firearms, radio collar frequency monitoring and immobilizing drugs) **May Affect, Not Likely to Adversely Affect** SNBS. In addition, WS-California expects that its activities will result in **No Destruction or Adverse Modification** of SNBS critical habitat.

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In Litt. Correspondence

Stephenson, T. 2021. Electronic mail from Tom Stephenson, California Department of Fish and Wildlife, to Brian Popper, U.S. Department of Agriculture, Animal Plant Health Inspection Service, Wildlife Services-California, with updated information in attached documents including number of mortalities from mountain lion predation.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Reno Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502

August 31, 2021
File No. 2021-I-0445

Mr. Dennis Orthmeyer
United States Department of Agriculture
Animal and Plant Health Inspection Service,
Wildlife Services
3419A Arden Way
Sacramento, California 95825

Subject: Proposed Use of Integrated Wildlife Damage Management to Protect Sierra Nevada Bighorn Sheep from Predation in California

Dear Mr. Orthmeyer:

This correspondence responds to your request for informal consultation under the Endangered Species Act of 1973, as amended (ESA; 16 USC 1531 *et seq*.), and Biological Assessment (BA; U.S. Department of Agriculture (USDA) 2021) received on July 2, 2021, for the proposed Use of Integrated Wildlife Damage Management to Protect Sierra Nevada Bighorn Sheep from Predation in California. This proposal is for 10 years (2021 through 2030). You have requested concurrence from the U.S. Fish and Wildlife Service (Service), pursuant to section 7 of the ESA, on your determination that the project may affect, but is not likely to adversely affect the federally-listed as endangered Sierra Nevada bighorn sheep (SNBS; *Ovis canadensis sierrae*) or its designated critical habitat.

Project Description

Wildlife Services (WS)-California anticipates that the California Department of Fish and Wildlife (CDFW) will request assistance in the protection of SNBS from primarily mountain lions (*Puma concolor*) and other predators that are known to be depredating on SNBS (USDA 2021). Due to the SNBS's small population size across its range, predation can be a limiting factor in their recovery (Greene *et al*. 2016, Greene *et al*. 2017, Greene *et al*. 2018).

Wildlife Services-California Overview

Wildlife Services is authorized and directed to resolve conflicts involving damage associated with wildlife, including animals preying on or harassing livestock and wildlife, damaging property, or threatening human health and safety. The most effective approach to resolving wildlife damage is to integrate the use of several safe and practical management methods simultaneously or sequentially. Integrated Wildlife Damage Management (IWDM) draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. It may incorporate cultural practices (*i.e.*, animal husbandry), habitat modification, altering animal behavior (*i.e.*, harassment), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

Wildlife Services-California conducts technical assistance (education, information, and advice), which is the responsibility of the requestor to implement. Consequently, these methods are not included in this consultation and will not be discussed further as they are not implemented by WS-California personnel. Wildlife Services-California also conducts operational assistance (preventative and corrective). These activities are conducted or supervised by WS-California personnel. Wildlife Services-California considers the biology and behavior of the damaging species and other factors using the Wildlife Services Decision Model (Slate *et al*. 1992 as cited in USDA 2021). The recommended strategy(ies) may include any combination of proactive and reactive actions that could be implemented. Proactive management, the application of damage management strategies prior to damage occurring, is applied less often. Reactive management, that which is applied in response to a loss with the intent of abating or reducing further losses, is most often used.

Proposed Integrated Wildlife Damage Management Techniques

The proposed action is to apply certain IWDM techniques to protect SNBS through operational assistance. Managing predation on SNBS may involve the use of: (1) Cage traps, (2) foot/leg snares, (3) neck snares/Collarum ™, (4) padded-jaw foot-hold traps, (5) tracking and trailing dogs, (6) firearms, and (7) immobilizing agents. Each of these have been described in the BA (USDA 2021). In addition, WS-California personnel may assist CDFW's efforts to protect SNBS from predation by collaring some mountain lions, replacing old collars on select mountain lions, and monitoring collared mountain lions using dogs. Wildlife Services-California may be asked to monitor Very High Frequency (VHF) radio frequencies and the Global Positioning System (GPS) to locate animals collared by CDFW (SNBS and mountain lions) in addition to the mountain lions collared by WS-California when conducting the proposed activities. The monitoring of VHF collars would occur from the ground with observers using an antenna, binoculars, and spotting scopes to locate collared animals. Animals wearing GPS collars are located by remotely downloading information from the collars using the satellite telephone network. Wildlife Services-California may be asked by CDFW to investigate SNBS mortalities to assist in determining cause of death and whether a collared predator killed a SNBS.

To access the sites to conduct IWDM activities for this project, WS-California personnel will use vehicles (defined as 4-wheel drive or all-terrain vehicles for this request), horses/mules (hoof stock), or enter the area on foot. No proposed project activities will occur from the air. Wildlife Services-California personnel working on the project will be limited to 3 staff and no more than 10 trained dogs. Sites may be accessed any time of the year, with most of the work focused on the spring through fall months.

Non-lethal Methods

Non-lethal methods used in the management of SNBS predators are cage traps, neck snares/Collarum ™, padded-jaw foot-hold traps, tracking and trailing dogs, and drug delivery devices. Some capture devices, such as snares, can be both non-lethal and lethal depending on how the device is set. Wildlife Services-California personnel check devices daily or at other frequencies following State laws and regulations regarding the setting and checking of traps and snares per Wildlife Services Directive 2.450 and 2.210 (USDA 2018 as cited in USDA 2021). After capture, the animal can either be released on site or euthanized. Predators that are captured can be fitted with telemetry collars, allowing for tracking after release.

Relocation is also an option; relocation is the translocation of an individual that is causing damage from the area to an area where it will hopefully not be able to continue problematic behavior. While relocation is a non-lethal option, WS-California typically does not relocate predators that are creating a predation threat to SNBS. Any relocations will be performed by CDFW with WS-California assistance limited to locating and capturing mountain lions.

Trained Dogs

Trained dogs are used to trail certain species, identify sites to set equipment where target wildlife might be travelling, to tree specific species of wildlife for capture or removal, and as a decoy to draw target species closer for shooting activities. In order to stop the potential spread of diseases from the tracking and trailing hounds to wildlife, all hounds will be vaccinated for canine distemper, canine adenovirus type 1 and 2, canine parainfluenza, canine parvovirus and 4 types of *Leptospira* (*L. canicola*, *L. grippotyphosa*, *L. icterohaemorrhagiae*, and *L. pomona*) using a commercially available combination vaccination. Trained dogs can be decoy dogs, detection dogs, and trailing dogs, which have been described in the BA (USDA 2021). Dogs are trained to ignore the scents of non-target species.

Chemical Immobilization

Chemical immobilization is the use of drugs such as telazol and ketamine/xylazine to restrain wildlife to allow for activities such as collaring and sample collection. This process can be dangerous both for personnel and the animal and requires training and experience.

These immobilizing agents produce central nervous depression through various means and render the animal unconscious. They are delivered to the target animal with a dart gun, blow gun, or syringe pole depending on the circumstances and the species being immobilized. If the agents are delivered via a dart, the dart is retrieved if possible. For this project, the animal is typically treed with dogs or physically restrained by a trap and then the drug is delivered to the animal. Once the procedures are completed the animal is monitored until it is recovered. For some of the immobilizing drugs, this means allowing the drugs to work through the animal's system. For others, there are antagonists that can be given that reverse the effects of the immobilizing drug such as yohimbine for xylazine.

Lethal Methods

Lethal methods can be implemented by trained and certified WS-California personnel. The use of firearms, often in conjunction with other methods is the most frequently used method in the protection of SNBS. Methods used to capture predators prior to lethal removal by firearm include cage traps, foot/leg snares, padded-jaw foot-hold traps, and tracking and trailing dogs.

Shooting

Firearms are used to selectively remove individual animals. Shooting to selectively remove individual animals is a very specific method and a properly placed gunshot can cause immediate insensibility and a humane death (American Veterinary Medical Association (AVMA) 2020 as cited in USDA 2021). Wildlife Services-California personnel kill animals as quickly and humanly as possible; under some conditions a gunshot may be the only practical method of euthanasia (AVMA 2020 as cited in USDA 2021). This method is selective for target species.

All applicable firearm safety precautions, laws, and regulations governing the use of firearms are followed by WS-California when conducting IWDM activities. To ensure WS-California personnel receive uniform firearms safety training, National Rifle Association (NRA) certified instructors and the NRA's curriculum for the basic pistol, rifle, and shotgun certifications are the officially recognized program for initial WS-California firearms safety training. Wildlife Services-California personnel will receive updated training per the Wildlife Services Firearms Safety Training Manual. Wildlife Services-California personnel commonly use firearms in combination with other techniques and/or modifications such as calling and night shooting. Only non-lead (non-toxic) ammunition (including shot and pellets) will be used on this project due to

California state law (AB711) and subsequent regulations promulgated by the California Fish and Game Commission. Firearms create high intensity sound for short durations. When possible, without reducing the effectiveness of the methods, WS-California use suppressors (silencers) and specific ammunition (subsonic) to minimize the audio report of firearms. Suppressors and subsonic ammunition are most used with rifles. Shotguns cannot always be suppressed without affecting shot pattern and/or shooting accuracy.

The proposed project will occur in California where IWDM is used to remove predators for the protection of SNBS within its range. Sierra Nevada bighorn sheep occur in several counties including: Tuolumne, Mono, Fresno, Inyo, and Tulare; however, most of the work protecting SNBS from predation is expected to occur in Mono and Inyo Counties, California.

Effects of the Project on Sierra Nevada Bighorn Sheep

Direct impacts to SNBS from the proposed action would be unlikely due to: (1) Selection and implementation of devices, their minimizing measures, and exclusionary features for non-targeted species by trained WS-California personnel, (2) device placement is generally outside of SNBS habitats, (3) lack of attraction to bait products by SNBS, (4) shared information regarding SNBS locations and their avoidance by WS personnel, (5) ground monitoring from a distance is unlikely to disturb SNBS or cause injury or mortality, (6) any noise disturbance from personnel, vehicles, or dogs that result in SNBS movements would be minimal, and (7) dogs are trained to ignore non-target animals and are under the supervision of WS-California personnel. Indirect effects of the proposed action to SNBS would be beneficial due to the removal of mountain lions and other predators that negatively affect SNBS population numbers. Predator removal would assist in the long-term survival and recovery of SNBS in California.

Critical habitat has been designated for SNBS. Based on the project description, no more than minimal ground disturbance would result from the use of the proposed activities/ devices. Therefore, the action is not likely to result in the destruction or adverse modification of critical habitat.

Conclusion

The Service has reviewed the project description in your request to consult, and we concur with your determination that the proposed project may affect, but is not likely to adversely affect SNBS. The proposed project is also not likely to result in destruction or adverse modification of critical habitat. Our concurrence is based on the project description and accompanying effects analysis provided by your agency.

This concludes informal consultation on the proposed project under regulations promulgated in 50 CFR Part 402, which establish procedures governing interagency consultation under section 7 of the ESA. This informal consultation does not authorize incidental take of SNBS. If this action changes from the description provided, or if new biological information becomes available concerning listed or candidate species which may be affected by the action, your agency should contact our office regarding reinitiating consultation with the Service.

Please reference File No. 2021-I-0445 in any future correspondence concerning this consultation. If you have any questions or require additional information, please contact me or Marcy Haworth at (775) 861-6300. Please note, we now accept official correspondence at RFWOmail@fws.gov.

Sincerely,

MARC JACKSON Digitally signed by MARC JACKSON
Date: 2021.09.01 13:28:21 -07'00'

Marc Jackson
Field Supervisor
Reno Fish and Wildlife Office

Literature Cited

Greene, L.E., C.P. Massing, D.W. German, J.D. Wehausen, A.C. Sturgill, A.P. Johnson, K. Anderson, E.A. Siemion, D.B. Spitz, and T.R. Stephenson. 2016. Sierra Nevada Bighorn Sheep Recovery Program 2015-2016 Annual Report. California Department of Fish and Wildlife. Bishop, California. 18 pp. plus appendices.

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U.S. Department of Agriculture (USDA). 2021. Effects of Wildlife Services Protection of SNBHS from Predation in California. Sacramento, California. 26 pp.

Effects of Wildlife Services Integrated Wildlife Damage Management on the Sierra Nevada DPS of the Sierra Nevada Red Fox in California

Prepared by:
United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
3419A Arden Way
Sacramento, California 95825

July 2022

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LIST OF FIGURES AND TABLES

ACRONYMS

AVMA	American Veterinary Medical Association
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
DPS	Distinct Population Segment
ESA	Endangered Species Act
FR	Federal Register
IWDM	Integrated Wildlife Damage Management
MOU	Memorandum of Understanding
NPS	National Park Service
SNRF	Sierra Nevada DPS of Sierra Nevada Red Fox
T&E	Threatened and Endangered
USDA	United States Department of Agriculture
WS	Wildlife Services
WS-California	Wildlife Services-California

EXECUTIVE SUMMARY

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service, Wildlife Services (WS) California (WS-California) conducts integrated wildlife damage management (IWDM) within the range of the Sierra Nevada distinct population segment (DPS) of the Sierra Nevada Red Fox (*Vulpes vulpes necator;* SNRF). WS-California uses IWDM to protect human health and safety, agriculture, property, and threatened and endangered (T&E) species. This Request for a Letter of Concurrence (hereafter Request) addresses the possible effects of WS-California's use of IWDM on SNRF.

INTRODUCTION

Purpose of this Request

This Request evaluates potential effects of IWDM (resolving wildlife damage integrating the use of several management methods based on analysis of the situation and informed judgement of trained personnel) on federally listed Sierra Nevada DPS of the Sierra Nevada Red Fox under section 7 of the federal Endangered Species Act (ESA) of 1973, as amended. WS-California is the action agency and lead federal agency for this ESA consultation. At the request of land and resource managers, WS-California implements IWDM to alleviate damage from wildlife to agriculture, human health and safety, natural resources, and property. This Request and the findings are based on the best current data and scientific information available. Unless there is a need to prepare a new analysis, this consultation will be in effect for 10 years.

Consultation History

There is no consultation history between USFWS and WS-California for the SNRF.

Authorities

WS is authorized by Congress to protect American agriculture and other resources from damage associated with wildlife by providing assistance to agencies, organizations, and individuals in resolving wildlife conflicts. The Act of March 2, 1931 (46 Stat. 1468-69, 7 U.S.C §§ 8351-8352) states: "*The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program….*" The Act of March 2, 1931, as amended (7 U.S.C. § 8351 – Predatory and other wild animals and § 8352 – Authorization of expenditures for the eradication and control of predatory and other wildlife animals), authorizes the Secretary of Agriculture to conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary deems necessary in conducting the program. The Secretary of Agriculture has delegated this authority to Wildlife Services (WS Directive 1.210: Legal Authority). The Act was amended in 1987 (The Act of December 22, 1987 (Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 8353)) to further provide: "*On or after December 22, 1987, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control Activities.*"

PROJECT DESCRIPTION

Project Location

The proposed project is in California anywhere IWDM is used in response to wildlife related damage within the range of the SNRF (Figure 1). The SNRF range runs along the Sierra crest in Alpine, Tuolumne, Mono, Madera, Fresno, and Inyo counties.

Project Justification

At the request of land and resource managers, WS-California implements IWDM activities to alleviate damage from avian, mammalian, and/or reptilian predators on a local population in localized areas. To accomplish this WS-California will identify individuals or groups of animals that may harm the protected resource and choose the most effective, selective, and humane methods legally available to deter or remove the species that threaten the protected resource. The strategies would include education and advice, as well as non-lethal and lethal methods. In the counties that encompass SNRF range, the resources protected include aquaculture, field and orchard crops, trees, and livestock; rangelands; human health and safety such as threat of disease and direct threat from wildlife; natural resources including T&E species protection; and property such as buildings, gardens, turf, and golf courses. Table 1 lists the mammalian species that WS-California will potentially target within SNRF range.

Wildlife Services-California Overview

WS is authorized and directed to resolve conflicts involving damage associated with wildlife, including animals preying on or harassing livestock and wildlife, damaging property, or threatening human health and safety. WS-California is a collection of cooperative programs with other federal, state, and local agencies, private individuals, and associations to protect livestock, poultry, natural resources (e.g., wildlife), property, and human health and safety from wildlife threats and damages. WS-California conducts technical assistance (education, information, and advice), and operational assistance (preventative and corrective) to achieve these goals. Operational assistance on public and private lands is conducted under memoranda of understanding (MOUs), cooperative agreements, or agreements for control. All IWDM is based on interagency relationships, which require close coordination and cooperation because of overlapping authorities and legal mandates.

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and control of damage caused by wildlife based on analysis and the informed judgment of trained personnel. The philosophy behind IWDM is to implement effective management techniques in a cost-effective manor while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of

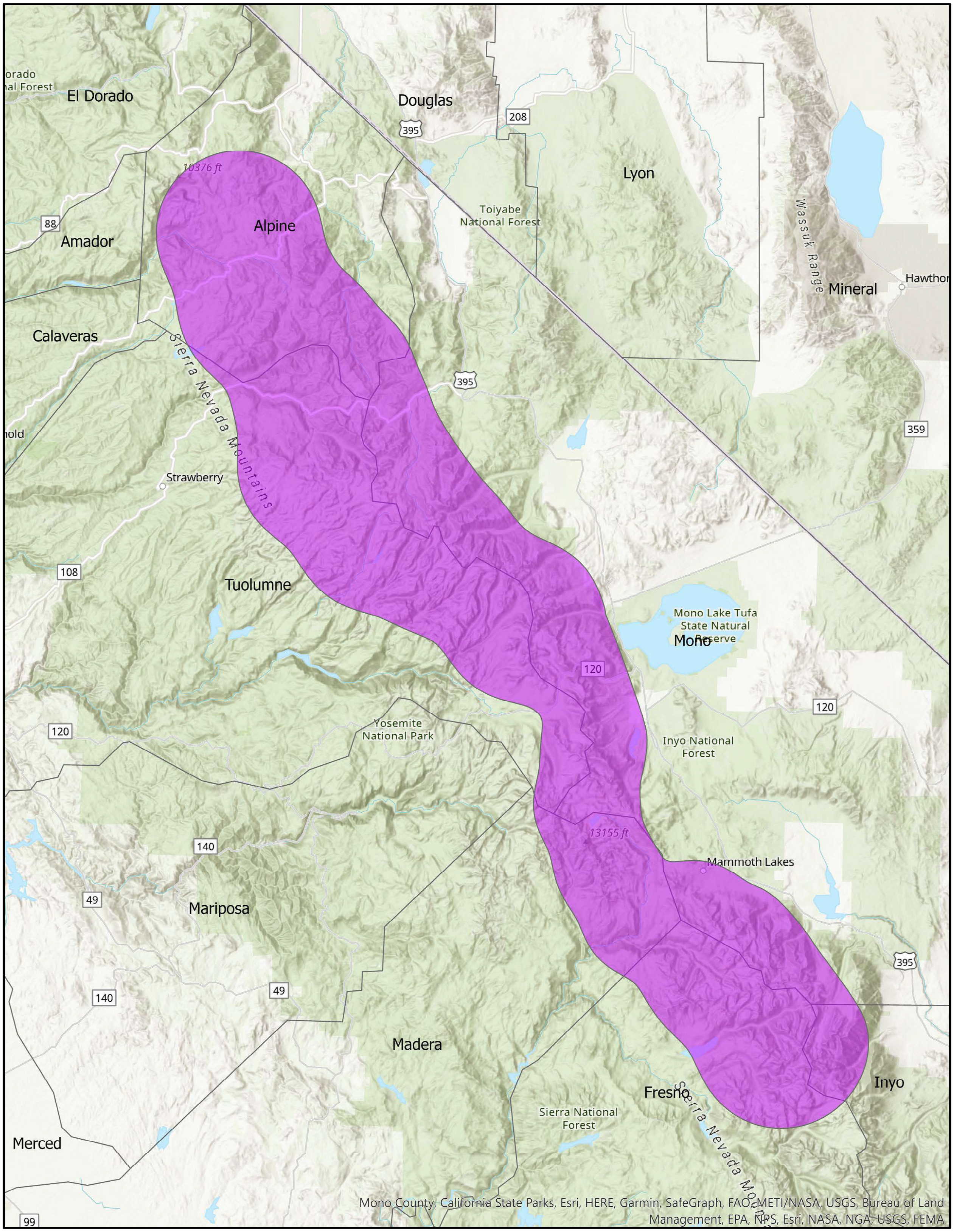

Figure 1. Map of Sierra Nevada DPS Sierra Nevada Red Fox (Eyes 2021).

Table 1. Mammalian species targeted by WS-California within SNRF range.

Species	**Scientific Name**
Badger	*Taxidea taxus*
Black Bear	*Ursus americanus*
Beaver	*Castor canadensis*
Bobcat	*Lynx rufus*
Feral Cat	*Felis catus*
Coyote	*Canis latrans*
Mule Deer	*Odocoileus hemionus*
Gray Fox	*Urocyon cinereoargentueus*
Feral Goat	*Capra aegagtus hircus*
Mountain Lion	*Puma concolor*
Yellow-bellied Marmot	*Marmota flaviventris*
Virginia Opossum	*Didelphis virginiana*
Feral Rabbit	*Oryctolagus cuniculus*
Raccoon	*Procyon lotor*
Spotted Skunk	*Spilogale gracilis*
Striped Skunk	*Mephitis mephitis*
California Ground Squirrel	*Otospermophilus beecheyi*
Western Gray Squirrel	*Sciurus griseus*
Feral Swine	*Sus scrofa*

techniques appropriate for the specific circumstances. It may incorporate cultural practices (i.e. animal husbandry), habitat modification, altering animal behavior (i.e. harassment), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems. Consideration is given to the following factors before selecting or recommending control methods and techniques:

- species responsible for damage;
- magnitude, geographic extent, frequency, and duration of the problem;
- status of target and non-target species, including threatened and endangered species;
- local environmental conditions;
- potential biological, physical, economic, and social impacts;
- potential legal restrictions;
- costs of control options;
- what other strategies can be implemented if prevention efforts (non-lethal and lethal techniques) fail to stop damage.

Under the current program, WS-California receives requests for assistance from, and may enter into cooperative agreements with private landowners, livestock managers, Native American Indian tribal land managers, cooperating counties, Bureau of Land Management, U.S. Fish and

Wildlife Service, U.S. Forest Service, California Department of Water Resources, California Department of Fish and Wildlife (CDFW), California Department of Food and Agriculture, and other federal, state, county, and municipal agencies/entities. Some of the methods used in the current program include but are not limited to education about animal husbandry practices and cultural habits, tracking and trailing hounds, fencing recommendations, harassment, cage traps, culvert traps, snares, padded-jaw foot-hold traps, and shooting. These methods may be recommended by WS-California via technical assistance or implemented by WS-California via operational assistance. Most IWDM methods have recognized strengths and weaknesses relative to each specific predator damage situation. WS-California personnel can determine for each IWDM activity what method or combination of methods are most appropriate and effective by using the WS Decision Model (Figure 2; Slate et al. 1992). Several methods are available for consideration in the process. WS-California conducts direct control activities on lands where signed Work Initiation Documents for Wildlife Damage Management (formally called Agreements for Control on private/non-private Property) have been executed. These agreements list the intended target animals and methods to be used. In some cases, with public land agencies, a MOU serves as these Work Initiation Documents for control activities.

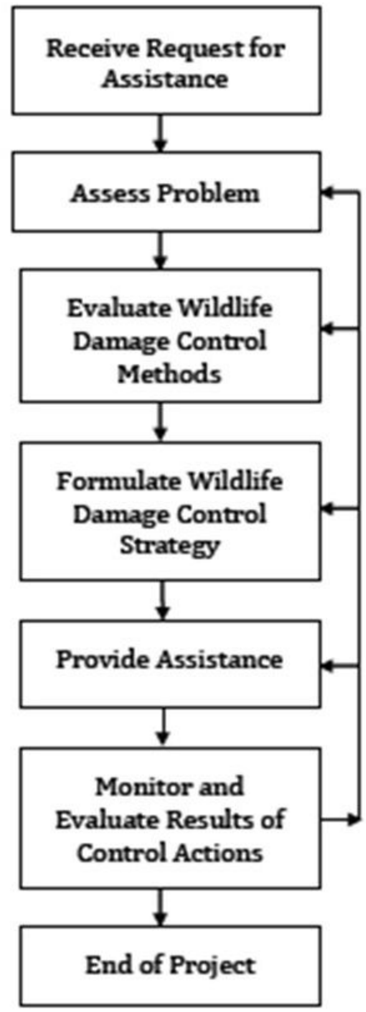

Figure 2. WS Decision Model (Slate et al. 1992)

Types of Management Assistance

Technical Assistance

Technical assistance recommendations are the responsibility of the requestor to implement. WS-California personnel provide information, demonstrations, and advice on many of the available IWDM techniques. Technical assistance includes demonstrations on the proper use of management devices and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Deciding which recommendations to suggest to a requestor may require substantial effort by WS-California. Part of the decision-making process includes an on-site visit or verbal consultation with the requestor. Generally, several short and long-term management strategies are described. Because the requestor is primarily responsible for implementing these strategies, the recommendations are based on the abilities of the requestor, the level of risk, need, and practical application.

A wide range of management tools could be recommended by WS-California to alleviate wildlife damage, for landowner/resource managers to implement. Compliance with applicable federal, state, and local laws and regulations is the responsibility of the landowner/resource owner implementing the methods. Consequently, these methods are not included in this consultation and will not be discussed further because they are not implemented by WS-California personnel.

Operational Assistance

Operational assistance includes activities conducted or supervised by WS-California personnel. Operational assistance is implemented when the problem cannot effectively be resolved through technical assistance and when Cooperative Agreements provide for WS-California operational assistance. The initial investigation defines the nature and history of the problem, extent of the damage, and the species responsible for the damage. The professional skills of WS-California personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or if the problem is too complex and requires the direct supervision of a wildlife professional.

WS-California considers the biology and behavior of the damaging species and other factors using the Wildlife Services Decision Model (Slate et al. 1992). The recommended strategy (ies) may include any combination of proactive and reactive actions that could be implemented by the requestor, WS-California, or other agencies, as appropriate. However, reactive management, that which is applied in response to a loss with the intent of abating or reducing further losses, is most often used. Proactive management, the application of damage management strategies prior to damage occurring, is applied less frequently, usually in areas with historical, chronic damage problems.

Integrated Wildlife Damage Management

WS-California has a wide range of management techniques with which to perform IWDM to support human health and safety, protect T&E species, and to protect property. WS-California personnel use the WS Decision Model to ascertain which method(s) should be used in each situation and how long the method is used before changing to a new method or ending the project. Only management techniques used for IWDM activities within the range of the SNRF are described in the following sections.

Non-lethal Methods

Non-lethal methods used in SNRF range include several kinds of capture devices including traps and immobilizing equipment and agents. Some capture devices, such as snares, can be both non-lethal and lethal depending on how the device is set. After capture the animal can either be released on site or euthanized. Captured wildlife can be fitted with telemetry collars, allowing for tracking after release. Relocation is also an option; however, it is not typically performed by WS-California. Any relocations are performed in accordance with guidelines from the appropriate regulatory agency.

Relocation is the translocation of an individual that is causing damage from the area to an area where it will hopefully not be able to continue problematic behavior. While relocation is a non-lethal option, WS-California typically does not relocate mammals that are creating conflicts. In addition, translocation of wild animals is discouraged by WS policy (WS Directive 2.501, USDA 2021b) because of stress to the relocated animal and poor survival rates due to intraspecific strife with established resident animals, and because of difficulties in adapting to new locations or habitats.

<u>One-way Door Excluders</u>

One-way door excluders are devices usually used in urban setting to allow an animal to leave an area where it is unwanted by way of a one-way door or a narrowing exit that prevents them from re-entering through the same entrance. They can be used for small mammals, meso-mammals, bats, and some bird species. They are installed over a hole usually in the side of a house or other building with the door opening from the inside of the structure out. Once the animal has exited, the door serves as a barrier to re-entrance. Once it is ascertained that no more animals are in the structure, the landowner is usually advised to repair the hole.

<u>Mechanical Repellents</u>

Mechanical repellents consist of several methods involving lights, sounds, and/or spraying water to create aversion to an area where wildlife is causing damage. These methods should be changed frequently as wildlife usually become habituated to scare devices; motion activated systems can extend the effective period of this technique. Some examples of this are distress or alarm calls, motion activated strobe lights and sirens, and water spraying when an animal enters a certain area.

<u>Chemical Repellents</u>

Chemical repellents are usually naturally occurring substances or formulated chemicals that are distasteful or elicit a behavioral response from target animals when they are smelled, tasted, or contacted. Effective and practical chemical repellents should be non-toxic to target predators, other wildlife, plants, and humans; resistant to weathering; easily applied; and highly effective.

The reaction of different animals to a particular chemical varies, and for many species there may be variations in repellency between different habitat types. Effectiveness depends on the resource to be protected, time and length of application, and sensitivity of the species causing damage. Chemicals are not used by WS-California on public or private lands without authorization from the land management agency or property owner or manager.

Capture Methods

Live capture methods are used to capture individuals causing damage. Most of these traps are set to capture and hold the animal alive until personnel arrive. The animal can be euthanized or released as appropriate. Traps set by WS-California personnel are checked daily by WS-California personnel, the landowner/manager, or their designated agent in accordance with California state law (14 CCR § 465.5(g)(2)).

Cage Traps - Cage traps are non-lethal capture devices. The size of the cage trap depends on the size of the targeted species; this helps limit the capture of non-target species by physically excluding them from the trap. Traps are set near signs of damage or in areas where the target species is known to travel and are usually baited with species-specific baits. Cage traps set by WS-California personnel are checked daily.

Cage traps are typically set with a bait or lure to encourage the target species to enter the trap. Baits can be chosen to be selective for target species. A trigger mechanism usually located at the back of the trap is triggered by the animal and the trap closes. The animal is enclosed in the trap and held until it is subsequently released or euthanized. Because the animal is held alive, if a non-target animal is captured, it can usually be released unharmed.

Cage traps used to capture mountain lions are typically constructed of commercial livestock panels made of 3/16" galvanized welded rods. The top, sides, front, and bottom panels are welded together, and panel openings are approximately 2"x4". These cage traps may have a treadle type trigger or trip line and a single-catch, multi-catch, or gravity door.

Large cage traps are occasionally used by WS-California to capture bobcats and feral dogs. WS-California defines large cage traps as being larger than 12"x12"x36", but not culvert traps. Large cage traps vary in size and shape depending on the species being targeted. Bobcat or dog-size cage traps are made of welded wire, utilize a treadle type trigger or trip line system and close with a spring or gravity door.

Cage traps measuring 12"x12"x32" and smaller are typically used by WS-California for capturing animals the size of raccoon and smaller. They are often set in urban areas to capture meso-mammals such as raccoons and skunks that are causing damage. These sites are usually more disturbed areas and not as likely to be frequented by SNRF. While many cage traps are welded wire style traps, some small cage traps are constructed from a tube or a plastic box. The trap functions in a similar way to the more common welded wire style traps.

Culvert Traps - Culvert traps are a type of trap constructed of solid material as opposed to welded wire or livestock panels used in large cage traps. They have differing trigger systems but usually utilize swing doors and are often on a wheeled platform or trailer for transport. WS-California often uses this type of trap when dealing with black bears that are in urban/suburban settings, although they can also be used in rural areas and for other species. Due to the size and weight of most culvert traps, they are primarily restricted for use near roadways, although models exist that may be disassembled and reconstructed in remote areas. The type of bait used depends on the nature of the damage problem. WS-California implements a daily trap check for all culvert traps. Non-target animals are generally released uninjured, and target animals are usually euthanized or relocated as appropriate and when authorized by the CDFW.

Snares - Snares made of wire or cables are among the oldest wildlife management tools and are generally not affected by inclement weather. They can be used effectively to catch most species. Snares may be employed as either lethal or live-capture devices depending on how or where they are set. Most snares are also equipped with a swivel to minimize injuries to the captured animal and reduce twisting and breakage of the snare cable. Breakaway devices can also be incorporated into snares, allowing the loop to break open and release the animal when a specific amount of force is applied. These devices can improve the selectivity of cable restraints to reduce capture of non-target species.

Snares set to capture an animal by the neck are usually lethal but stops can be applied to the cable to make the snare a live capture device. Snares positioned to capture the animal around the body can be useful live-capture devices. Snares can be effectively used wherever a target animal moves through a restricted lane of travel (i.e., "crawl holes" under fences, trails through vegetation, or den entrances). When an animal moves forward into the loop formed by the cable, the snare tightens, and the animal is held.

Foot snares are a spring-powered non-lethal device, activated when an animal places its foot on the trigger pan. In some situations, using hanging snares to capture wildlife is impractical due to the behavior or morphology of the animal, or the location of many wildlife conflicts. Neck snares must be set in locations where the likelihood of capturing non-target animals is minimized, but foot snares with built-in pan tension devices can be set to exclude animals lighter than the target animal.

Foot snares set for bear are usually set with the trigger in a vertical pipe, large enough for a bear's paw, buried vertically, so that the top is flush with the ground. The cable loop is placed around the circumference of the pipe, and bait is placed in the pipe, under the trigger. When the animal reaches into the pipe, it sets off the trigger and a cable loop is propelled onto the animal's leg.

The Collarum™ is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes. The trigger is designed specifically for canines, which use a distinct pulling motion to set off the device. The device uses an attractant and is activated when an animal bites and pulls a cap. The snare is then projected from the ground up and over the head of the coyote. A stop on the device limits loop closure and prevents capture of smaller non-target wildlife. As with other types of snares, the use of the Collarum™ device to capture coyotes is greatly dependent upon finding a location where they frequently travel.

Padded-jaw Foot-hold Traps - Padded-jaw foot-hold traps are coil spring traps with rotating jaws. They have centrally attached inline shock springs, swivels to allow for movement, and are equipped with non-hardening rubber on the face of the jaw. These traps come in several sizes depending on the target species. Padded-jaw foot-hold traps are designed to close on an animal's foot and hold the animal without injuring it. They have adjustable pan tension triggers which allow the exclusion of animals smaller than the target species. These traps can be used for live-capture and release or hold for subsequent euthanasia. Padded-jaw foot-hold traps usually permit the release of non-target animals unharmed.

Traps are placed in the travel paths of target animals, and some are baited or scented, using an olfactory attractant, such as the species' preferred food, urine, or musk/gland oils. The use of baits also helps to facilitate the prompt capture of target predators. This often decreases the total time traps are in the field, thereby lowering risks to non-target animals. In some situations, a draw station—a carcass, or large piece of meat—is used to attract target animals. In this approach, one or more traps are placed in the vicinity of the draw station. WS Directive 2.450 prohibits the placement of traps closer than 30 feet to the draw station to reduce the risk to non-target animals (USDA 2021b).

Padded-jaw foot-hold traps set for mountain lions, bobcats, coyotes, and feral dogs are set with dirt or debris (e.g., leaf litter or rotting wood) sifted on top. The traps can be staked to the ground securely, attached to a solid structure (such as a tree trunk or heavy fence post), or used with a drag that becomes entangled in brush to prevent the trapped animal from escaping. Anchoring systems should provide enough resistance that if a larger animal is unintentionally captured, it should be able to either pull free from the trap or be held to prevent escaping with the trap on its foot.

Effective trap placement also contributes to trap selectivity. To minimize risk of capturing non-target animals, the user must be experienced and consider the target species' behavior, habitat, environmental condition, and the habitats of non-target animals. The pan tension, type of set, and attractant used greatly influence both capture efficiency and risks of catching non-target animals. The level of trap success is often determined by the ability of the user, through training, skill, and experience, to adapt the trap's use for specific conditions and species. WS-California personnel check these traps daily and follow state laws and regulations regarding the setting and checking of traps and snares per WS Directive 2.450 and 2.210 (USDA 2021b).

Padded foot-hold traps can be used in California for the protection of public safety and of threatened and endangered species (In Nat. Audubon Society v. Davis (N. D. Cal. 2000) 144 F. Supp. 2d 1160, the United States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of this method for the protection of threatened and endangered species.). Target animals may be euthanized, released on site, or relocated; non-target species may be released on site.

Catch Pole - A catch pole is a handheld device used to capture or safely handle animals. A catchpole is a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite of the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. For IWDM, catch poles are primarily used to capture animals partially restrained by barriers (i.e., a raccoon trapped in a building) or to remove live animals from traps without danger to or from the captured animal.

Trained Dogs - Trained dogs are used to trail certain species, identify sites to set equipment where target wildlife might be travelling, to tree specific species of wildlife for capture or removal, and as a decoy to draw target species closer for shooting activities. To stop the potential spread of diseases from the tracking and trailing hounds to wildlife all hounds will be vaccinated for Canine Distemper, Canine Adenovirus type 1 and 2, Canine Parainfluenza, Canine Parvovirus and 4 types of Leptospira (*L. canicola, L. grippotyphosa, L. icterohaemorrhagiae, & L. pomona*) using a commercially available combination vaccination and vaccinated and boosted for Rabies.

- *Decoy dogs* are sometimes used to lure coyotes within shooting distance. These dogs are kept under control of personnel and are unlikely to interact with wildlife.

- *Detection dogs* are used to identify sites where equipment may be effective by indicating where mountain lions, bears, coyotes, or other predators have traveled, urinated, or defecated. They are kept under the control of personnel and are unlikely to interact directly with wildlife.

- *Trailing dogs* are used by WS-California to trail mountain lions, bobcat, feral swine, and black bears. Dogs are trained to find and follow the scent of the target species. The dogs are tracked with GPS collars and stay with the animal until WS-California personnel arrive and then anesthetize, dispatch, or release it, depending on the situation. For instance, WS-California personnel assist CDFW by collaring mountain lions and bobcat with new radio telemetry collars, replacing old collars, and monitoring collared mountain lions using dogs. Dogs are trained to ignore the scents of non-target species.

<u>Chemical Immobilization</u>

Chemical immobilization is the use of drugs such as telazol and ketamine/xylazine to restrain wildlife to allow for activities such as collaring and sample collection. This process can be dangerous both for personnel and the animal and requires training and experience.

These immobilizing agents produce central nervous depression through various means and render the animal unconscious. They are delivered to the target animal with a dart gun, blow gun, or syringe pole depending on the circumstances and the species being immobilized. If the agents are delivered via a dart, the dart is retrieved if possible. Often, the animal is typically treed with dogs or physically restrained by a trap and then the drug is delivered to the animal.

Once the procedures are completed the animal is monitored until it is recovered. For some of the immobilizing drugs, this means allowing the drugs to work through the animal's system. For others, there are antagonists that can be given that reverse the effects of the immobilizing drug such as yohimbine for xylazine.

Lethal Methods

Lethal methods are often most appropriately used by trained and certified WS-California personnel. Firearms are often used in conjunction with non-lethal methods to attract the animal to an area or to capture the animal and hold it until personnel arrive. Methods used to attract or capture predators prior to lethal removal by firearm include calling, trained dogs, cage traps, foot/leg snares, and padded-jaw foot-hold traps. In addition, WS-California uses other lethal methods such as body-grip traps to remove wildlife that is causing damage.

Shooting

Firearms are used to selectively remove individual target animals. Shooting is a very specific method, and a properly placed gunshot can cause immediate insensibility and a humane death (AVMA 2020). WS-California personnel kill animals as quickly and humanly as possible; under some conditions a gunshot may be the only practical method of euthanasia (AVMA 2020). All applicable firearm safety precautions, laws, and regulations governing the use of firearms are followed by WS-California when conducting IWDM activities. To ensure WS-California employees receive uniform firearms safety training, National Rifle Association (NRA) certified instructors and the NRA's curriculum for the basic pistol, rifle, and shotgun certifications are the officially recognized program for initial WS-California firearms safety training. WS-California personnel will receive updated training per the WS Firearms Safety Training Manual. More detailed information on WS-California firearm use, training, and storage can be found in WS Directive 2.615: WS Firearm Use and Safety (USDA 2021b). WS-California personnel commonly use firearms in combination with other techniques and/or modifications listed below.

- *Calling* consists of using voice, mouth, handheld, or electronic calls to draw predators into the area. Calling is often used to draw the target species into firearm range.

- *Night shooting* may be conducted with spotlights or night vision devices. Night vision devices are undetectable to the surrounding environment. Spotlights are high intensity lights that are used to identify and cause the target species to temporarily pause its movements and/or flush when exposed for a length of time.

- *Non-lead (non-toxic) ammunition*. Effective July 1, 2015, California state law (AB711) and subsequent regulations promulgated by the California Fish and Game Commission require the use of nonlead ammunition in a phased approach when taking wildlife for recreation or depredation purposes. Effective July 1, 2019, nonlead ammunition is required for the taking of any wildlife for any reason. WS-California has made a transition to using nonlead ammunition when controlling wildlife. Nonlead ammunition is used when taking wildlife on this project. However, WS-California may use lead ammunition in cases of public safety or in certain situations for employee safety. In these cases, personnel remove the carcass of the animal from the environment. More information on the regulations and phased approach can be found at https://www.wildlife.ca.gov/Hunting/Nonlead-Ammunition.

- *Suppressors*. Firearms create high intensity sound for short durations. When possible, without reducing the effectiveness of the methods, WS-California uses suppressors (silencers) and specific ammunition (subsonic) to minimize the audio report of firearms. Suppressors and subsonic ammunition are most used with rifles. Shotguns cannot always be suppressed without affecting shot pattern and/or shooting accuracy.

Body Grip (Quick-kill) Traps

Body grip traps (also known as quick-kill traps) are frequently used by WS-California to lethally remove beaver. The body-grip trap is lightweight, easily set, and consists of a pair of rectangular wire frames that close when triggered, killing the captured animal with a quick body blow. Body grip traps are lethal to both target and non-target animals. Within the range of SNRF, body grip traps used to lethally remove beaver will be set underwater in the entrances of beaver lodges, in underwater travel corridors, or areas at or near a beaver dam or other beaver activity. Body grip traps set for beaver may be used in both urban and rural areas and set types generally preclude non-target animals from capture.

Site Access

Before WS-California conducts any wildlife damage management, a request must first be received, and *Work Initiation Documents for Wildlife Damage Management* must be signed by the landowner/administrator for private lands or other comparable documents for public or tribal lands must be in place. WS-California uses 4-wheel drive vehicles, all-terrain vehicles (ATVs), or hoof stock for conveyance when conducting IWDM activities. Personnel also enter areas on foot. When operating on federally or state-owned lands, all WS-California compliance terms and conditions are set forth in WS-California MOUs with land management agencies. In addition to vehicles and personnel, dogs are regularly used for field work on this project. WS-California personnel conducting IWDM activities within SNRF range will be limited to four staff and no more than 10 trained dogs.

PROTECTED SPECIES INFORMATION

Sierra Nevada DPS of Sierra Nevada Red Fox

The Sierra Nevada Red Fox is a subspecies of red fox (*Vulpes vulpes*) separated into two DPSs: one found near Mt Lassen in the California Cascades and the other in the Sierra Nevada Mountains near Sonora Pass and northern Yosemite National Park (USFWS 2018). They tend to be smaller than the average North American red fox and is characterized by adaptations to cold areas including a thick, deep winter coat, longer hind feet, and small toe pads that are completely covered in winter by deep fur (USFWS 2018). They typically weigh between seven and nine pounds. The entire sub-species was listed by the state of California in 1980 as threatened. However, only the Sierra Nevada DPS of Sierra Nevada Red Fox has been federally listed at this time. Because of this, we are only considering the Sierra Nevada DPS and for the purposes of this document SNRF refers to the Sierra Nevada DPS of Sierra Nevada Red Fox.

Listing

The SNRF was listed as endangered under the ESA on August 3, 2021 (86 Federal Register (FR) 41743). The rule is effective as of September 2, 2021. It was determined that the designation of critical habitat for this DPS would not be prudent and therefore, no critical habitat for this DPS is designated at this time (86 FR 41743).

Range

The historic range of Sierra Nevada Red Fox ran along the upper elevations of the Sierra Nevada Mountain Range from Tulare to Sierra counties and in the California Cascades (USFWS 2018, Statham et al. 2012). Until recently the only known population of Sierra Nevada Red Fox was restricted to the Lassen Peak region, however, in 2010 a red fox was photographed at the Sierra Crest on the Humboldt-Toiyabe and Stanislaus National Forests (Statham et al. 2012). A subsequent study revealed a small number of individuals in this area (Statham et al. 2012). Two additional sightings near the intersection of Fresno/Mono/Inyo counties were reported in summer 2018 (85 FR 862). This recently discovered population is the SNRF. The current range of the SNRF runs southeast along the Sierra crest just south of California State Highway 88 to a few miles north of Kings Canyon National Park; this includes the easternmost portion of Yosemite National Park in Tuolumne and Madera Counties, as well as additional portions of those counties, and of Alpine, Mono, Fresno, and Inyo counties (86 FR 41743).

Habitat

SNRF typically inhabit subalpine habitat characterized by a mosaic of high-elevation meadows, rocky areas, scrub vegetation, and woodlands comprised of mountain hemlock (*Tsuga mertensiana*), whitebark pine (*Pinus albicaulis*), and lodgepole pine (*Pinus contorta*) (USFWS 2018). They have consistently been sighted at elevations ranging from 8714 to 11,608 feet (86

FR 41743). Montane subspecies of red fox tend to have large space requirements, and Quinn et al. (2019) observed a relatively constant density of two to five foxes/100 km^2 despite an increase in population size during a multiple year study. The growing season lasts between seven to nine weeks and snow cover is typically heavy (USFWS 2018). Small mammals and leporids are important food sources for SNRF, additionally, foxes will also utilize whitebark pine nut caches when available (USFWS 2018).

Reproduction and Survivorship

There is little direct information about the SNRF reproduction, however, it is likely similar to lowland dwelling red fox subspecies, except that it may be somewhat delayed to time pup-raising with increased available spring resources (USFWS 2018). Other subspecies are predominately monogamous with mating occurring in late winter and early spring, and birth occurring March through May (USFWS 2018). Several studies of montane foxes indicate that litters of two to three pups are the average, which is lower than the average litter size for the species (Perrine et al. 2010). This may be due to more limited resources available to montane subspecies (Perrine et al. 2010).

Population Decline and Viability

The SNRF has always been thought to occur at relatively low densities within its range; however, in the mid-1900s the population declined considerably (Perrine et al. 2010). The California legislature prohibited trapping and other non-scientific take of red fox throughout the state in 1974. The USFWS identified three major threats to the SNRF: deleterious impacts associate with small population size; over-hybridization with nonnative red fox; and competition with coyotes (86 FR 41743).

Large populations and multiple populations spread out over the habitat would help reduce the risk of losing this DPS. This DPS consists of one small population of 18-39 individuals (86 FR 41743). This number of individuals is below the estimated 150 or more individuals and the multiple populations spread out over the range estimated to be necessary to reduce risk associated with catastrophic events such as disease outbreaks or major wildfires (USFWS 2018).

The SNRF is restricted to one known population in the middle of its historical range (USFWS 2018). This population seems to be struggling with low reproductive success due to inbreeding depression with no evidence of reproduction of pure SNRF in a 50 square mile study site between 2011-2014 (USFWS 2018). During a seven-year study, Quinn et al. (2019) observed no reproduction in the first two years, followed by production of one to three litters/year all resulting directly or indirectly from matings involving immigrant foxes from a Great Basin Desert population. In the short term, these interbreedings seem to have enabled this population to expand in size. However, there is a potential that the interbreedings could cause swamping of locally adapted genes and/or the introduction of new deleterious alleles in the heterozygous recessive form (Quinn et al. 2019).

Coyotes occur at lower densities in subalpine habitat especially in the winter as compared to lower elevations due to lower small mammal densities and greater snowpack (USFWS 2018). This may make this habitat more attractive to red fox as coyotes have been known to exclude red foxes from certain areas by chasing and killing them (USFWS 2018). Over the past century average temperature and average number of days below freezing have decreased; these changes in temperatures could result in changed habitat conditions in subalpine habitat (86 FR 41743). These changed conditions may result in more amenable conditions for coyotes in the marginal habitats that foxes use to avoid competition and predation from coyotes.

MINIMIZING MEASURES

WS-California has established the following conservation measures to minimize risks to SNRF when conducting IWDM within the range of the SNRF.

- WS-California personnel will maintain communication with agencies and entities that keep track of locations of SNRF detections and den sites. WS-California will use information that these entities share on SNRF locations and den sites to determine trap location and selection.
- Wherever applicable, one-way door excluders and chemical repellents will be used to alleviate wildlife damage in structures.
- Cage traps will only be set near homes or buildings which are disturbed sites and are locations where SNRF are unlikely to frequent.
- Cage traps set for skunks will be tube traps. These traps have a six-inch diameter opening and it is less likely that a fox would enter the trap.
- Body grip traps will only be set submerged in the water where a fox is unlikely to encounter them.
- Snares and Collarum™ devices will be equipped with a stop device unless the snare is set underwater for beaver. Placement will be carefully considered to reduce the chances of catching a SNRF. Use of a stop and field placement of equipment will minimize impacts to non-target animals.
- The pan tension on padded-jaw foothold traps and foot snares will be set at five pounds to exclude SNRF when set above 6,000 feet.
- Culvert traps will utilize a trip wire set at a height such that a smaller animal such as a fox would pass under the trigger and not release the door which would capture the fox.
- Tracking and trailing dogs are trained by WS-California not to pursue species other than the targeted species (mountain lions, bobcats).
- To prevent the potential spread of diseases from the tracking and trailing hounds to wildlife, all hounds will be vaccinated and boostered as needed for Canine Distemper, Canine Adenovirus type 1 and 2, Canine Parainfluenza, Canine Parvovirus and 4 types of Leptospira (*L. canicola, L. grippotyphosa, L. icterohaemorrhagiae, & L. pomona*) using a commercially available combination vaccination and vaccinated and boosted for Rabies.

EFFECTS OF THE PROPOSED ACTION ON SNRF

The effects of the action are all consequences to listed species that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02, as amended August 27, 2019).

WS-California's actions are unlikely to negatively impact SNRF. IWDM is sporadic within SNRF range. In addition, many of the methods are used in more populated areas or can be used in such a way as to minimize effects on SNRF.

One-way door excluders and mechanical and chemical repellents are typically used in more urban settings. They are also non-lethal and would be unlikely to result in any harmful impacts if they were encountered by SNRF.

Firearms use is species specific and will not pose a threat to threatened or endangered species as SNRF are not the target. Similarly, chemical immobilization is hand injected or delivered via dart to the target animal and does not enter the surrounding environment. Catch poles are typically used to remove an animal from a trap or enclosed area. None of these techniques are expected to have negative impacts on SNRF as they are target specific and would not be used on SNRF.

Body grip traps will only be set in this area for beaver. This work will be very limited. Body grip traps set for beaver are set submerged in the water where SNRF are unlikely to encounter them. Therefore, WS-California's use of body grip traps for beaver work is unlikely to negatively impact SNRF.

Snares set within SNRF range will be either set underwater, where a fox is very unlikely to encounter them, or set on land with a stop incorporated on the loop of a neck snare or Collarum™ to prevent the loop from either opening or closing beyond a minimum or maximum loop circumference, which effectively excludes non-target animals.

Padded-jaw, foot-hold traps and foot snares are unlikely to have a negative impact on SNRF for the following reasons: 1) these methods are used infrequently within the range of SNRF and 2) species targeted by these methods (mountain lion, coyote) are heavier than SNRF and the pan tension will be set to prevent capture of animals as small as SNRF.

Cage traps are unlikely to have a negative impact on SNRF for the following reasons: 1) most cage traps set in SNRF range are set for heavier animals such as mountain lions, 2) WS-California infrequently sets small and medium cage traps in SNRF range and whenever possible, one-way door excluders and chemical repellents will be used to further reduce cage trap use, 3) cage traps will only be used around structures and these locations are less likely to be frequented by SNRF, and 4) when managing for skunks, tube cage traps will be used, which will make the capture of an SNRF unlikely.

WS-California does limited bear work within the range of SNRF. One of the main tools used to catch bear is a culvert trap. Culvert traps used within SNRF range will utilize a trip wire as a trigger set at a height in the trap that a SNRF would pass under without triggering the trap.

Dogs used to track mountain lions do not pose a direct threat to threatened or endangered species because they are trained to trail only the target animal (USDA 1999). The use of trained dogs, especially for trailing, has the potential to cause minor disturbance and an insignificant change in behavior of SNRF if hounds are chasing a lion in the vicinity of SNRF. Trailing hounds are trained by the handler to ignore non-target species but their presence, while temporary in nature, may cause disturbance. Dogs used in SNRF range will be fully vaccinated for canine diseases and not pose a risk of disease transmission to SNRF.

The presence of WS-California personnel is not expected to have a negative impact on SNRF. Few management activities are conducted within the range of SNRF. Those that are usually only require up to four personnel and up to 10 dogs. When conducting operations on state or federally owned lands, WS-California complies with the terms and conditions set forth in the MOUs and work plans between WS-California and the land management agency.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future state, tribal, or private activities, not involving federal activities, which are reasonably certain to occur within the action area of the federal action considered in this Request. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The following future, state, tribal, local, or private actions may affect the SNRF and/or result in direct SNRF mortality: habitat loss and fragmentation, reduction of habitat suitability, human induced mortality from vehicle strikes or other types of accidental take, and illegal take (poaching) of SNRF.

EFFECTS DETERMINATIONS

The SNRF is not targeted by WS-California actions. WS-California's IWDM program is designed to have an insignificant effect on non-target species. However, management actions for other species will occur within the range of this species.

WS-California's IWDM program is not expected to negatively impact the SNRF. WS-California performs a minimal amount of work within the range of the SNRF. Additionally, the minimizing measures described in this document will be followed to further reduce the possibility that this species will be impacted.

Some of the WS-California actions for this project require access to areas inhabited by SNRF by vehicle, hoof stock, and on foot. Vehicles will be limited to established roads. Management in SNRF range is minimal and access to the area on foot or by hoof stock would be spread out over time and space. In addition, trained dogs are used for some of the management activities in SNRF range. Like personnel presence, the presence of dogs within SNRF range would be spread out over time and space. Site access is not expected to cause long term disturbance of SNRF.

WS-California has determined that its site access **May Affect, Not Likely to Adversely Affect** SNRF. WS-California has further determined that the use of one-way door excluders, mechanical repellents, chemical repellents, snares/Collarum™, padded-jaw, foot-hold traps, catch poles, trained dogs, firearms, immobilizing drugs, body grip (quick-kill) traps, cage traps, and culvert traps **May Affect, Not Likely to Adversely Affect** SNRF.

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United States Department of the Interior

Pacific Southwest Region
FISH AND WILDLIFE SERVICE
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September 12, 2022
File No. 2022-0073553

Mr. Dennis Orthmeyer
United States Department of Agriculture
Animal and Plant Health Inspection Service,
Wildlife Services
3419A Arden Way
Sacramento, California 95825

Subject: Effects of Wildlife Services Integrated Wildlife Damage Management on the Sierra Nevada DPS of the Sierra Nevada Red Fox in California

Dear Mr. Orthmeyer:

This correspondence responds to your request for informal consultation under the Endangered Species Act of 1973, as amended (ESA; 16 USC 1531 *et seq*.), and the Biological Assessment (BA; (U.S. Department of Agriculture (USDA) 2022)) received on July 25, 2022, on the proposed effects of Wildlife Services' Integrated Wildlife Damage Management actions on the Sierra Nevada Distinct Population Segment (DPS) of the Sierra Nevada red fox (SNRF DPS; *Vulpes vulpes necator*) in California. The proposed action could occur anywhere within the range of the SNRF DPS, which occurs along the Sierra crest. The SNRF DPS may occur in the following California counties: Alpine, Tuolumne, Mono, Madera, Fresno, and Inyo. This proposal is for 10 years (2022 through 2031). You have requested concurrence from the U.S. Fish and Wildlife Service (Service), pursuant to section 7 of the ESA, on your determination that the project may affect, but is not likely to adversely affect the federally-listed as endangered SNRF DPS.

Project Description

Wildlife Services-California Overview

According to USDA (2022), Wildlife Services is authorized and directed to resolve conflicts involving damage associated with wildlife, including animals preying on or harassing livestock and wildlife, damaging property, or threatening human health and safety. Wildlife Services-California is a collection of cooperative programs with other Federal, State, and local agencies, and private organizations and individuals to protect livestock, poultry, natural resources, property, and human health and safety from wildlife threats and damages.

Wildlife Services-California conducts technical assistance (education, information, and advice), and operational assistance (preventive and corrective) to achieve these goals. Operational assistance on public and private lands is conducted under cooperative agreements, memoranda of understandings, or agreements for control. All Integrated Wildlife Damage Management (IWDM) is based on interagency relationships requiring close coordination and cooperation due to overlapping authorities and legal mandates.

The most effective approach to resolving wildlife damage is to integrate the use of several management methods simultaneously or sequentially. Integrated Wildlife Damage Management is the implementation and application of sage and practical methods to prevent and control damage caused by wildlife based on analysis and informed judgement of trained personnel and to implement them in a cost-effective manner while minimizing potentially harmful effects on humans, the environment, and target and non-target species.

Integrated Wildlife Damage Management draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. It may incorporate cultural practices (*i.e.*, animal husbandry), habitat modification, altering animal behavior (*i.e.*, harassment), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

Wildlife Services-California conducts technical assistance, which is the responsibility of the requestor to implement. Consequently, these methods are not included in this consultation and will not be discussed further as they are not implemented by WS-California personnel. Wildlife Services-California also conducts operational assistance. These activities are conducted or supervised by WS-California personnel. Wildlife Services-California considers the biology and behavior of the damaging species and other factors using the Wildlife Services Decision Model (Slate *et al*. 1992 as cited in USDA 2022). Additionally, WS-California personnel make decisions on how long a particular method is used before changing to another method or ending the project. The recommended strategy (ies) may include any combination of proactive and reactive actions that could be implemented. Proactive management, the application of damage management strategies prior to damage occurring, is applied less often. Reactive management, that which is applied in response to a loss with the intent of abating or reducing further losses, is most often used.

Proposed Integrated Wildlife Damage Management Techniques

The proposed action is to apply certain IWDM techniques to support human health and safety, to protect threatened and endangered species, and to protect property through operational assistance. According to USDA (2022), methods can be non-lethal or lethal; the following devices could be used for IWDM activities within the range of the SNRF DPS: (1) One-way door excluders, (2) mechanical repellants, (3) chemical repellants, (4) cage traps, (5) culvert traps, (6) foot snares, (7) neck snares/Collarum ™, (8) padded-jaw foot-hold traps, (9) catch pole, (10) trained dogs, (11) chemical immobilization, (12) firearms, and (13) body grip (quick kill) traps. Each of these devices have been described in the BA (USDA 2022).

To access the sites to conduct IWDM activities for this project, WS-California personnel will use vehicles (defined as 4-wheel drive or all-terrain vehicles for this request) limited to established roads, horses/mules (hoof stock), or enter the area on foot. Wildlife Services-California personnel working on the project within SNRF DPS range will be limited to 4 staff and no more than 10 trained dogs.

Non-lethal Methods

Excluders, Repellants, and Live Capture Methods

Non-lethal methods used in IWDM activities within the range of the SNRF DPS include one-way door excluders, mechanical and chemical repellants, cage and culvert traps, foot and neck snares/Collarum TM, padded-jaw foot-hold traps, catch pole, trained dogs, and chemical immobilization. Some capture devices, such as snares, can be both non-lethal and lethal depending on how the device is set. Traps set by Wildlife Services-California personnel are checked daily by Wildlife Services-California personnel, the landowner/ manager, or their designated agent in accordance with California State law (14 CCR § 465.5(g)(2)) (USDA 2022).

One-way door excluders allow an animal to leave an area by a one-way door or narrow opening that prevents them from re-entry through the same entrance. Mechanical and chemical repellents consist of lights, sounds (distress or alarm calls), and/or spraying water or naturally-occurring substances or formulated chemicals that taste or smell badly or irritate on contact to create an aversion to an area, respectively. Mechanical repellents should be changed frequently as wildlife can become habituated. Chemical repellents should be non-toxic to targeted predators, other wildlife, plants, and humans; resistant to weathering; easily applied; and highly effective.

Live capture methods include cage and culvert traps, snares, foot-hold traps, and catch poles. Devices are placed in areas of damage or in areas where the target species travels. These devices can have different triggering mechanisms, swivels, built-in pan tensions, stops, anchoring systems, and selective baits/attractants, which help to minimize injuries to targeted species and prevent capture of non-targeted species. Effective trap placement is also important in minimizing the capturing of non-targeted animals. After capture, the animal can either be released on site or euthanized. Captured wildlife can be fitted with telemetry collars, allowing for tracking after release. While relocation (the translocation of an individual that is causing damage from the area to an area where it will hopefully not be able to continue problematic behavior) is an option, it is not typically performed by WS-California (USDA 2022). Any relocation would be performed in accordance with guidelines from the appropriate regulatory agency (USDA 2022).

Trained Dogs

Trained dogs are used to trail certain species, identify sites to set equipment where target wildlife might be travelling, to tree specific species of wildlife for capture or removal, and as a decoy to draw target species closer for shooting activities. To stop the potential spread of diseases from the tracking and trailing hounds to wildlife, all hounds will be vaccinated for canine distemper, canine adenovirus type 1 and 2, canine parainfluenza, canine parvovirus and 4 types of *Leptospira* (*L. canicola*, *L. grippotyphosa*, *L. icterohaemorrhagiae*, and *L. pomona*) using a commercially available combination vaccination. Trained dogs can be decoy dogs, detection dogs, and trailing dogs, which have been described in the BA (USDA 2022). Dogs are trained to ignore the scents of non-target species.

Chemical Immobilization

Chemical immobilization is the use of drugs such as telazol and ketamine/xylazine to restrain wildlife to allow for activities such as collaring and sample collection. This process can be dangerous both for personnel and the animal and requires training and experience.

These immobilizing agents produce central nervous depression through various means and render the animal unconscious. They are delivered to the target animal with a dart gun, blow gun, or syringe pole depending on the circumstances and the species being immobilized. If the agents are delivered via a dart, the dart is retrieved if possible. The targeted animal is typically treed with dogs or physically restrained by a trap and then the drug is delivered to the animal. Once the procedures are completed, the animal is monitored until it is recovered. For some of the immobilizing drugs, this means allowing the drugs to work through the animal’s system. For others, there are antagonists that can be given that reverse the effects of the immobilizing drug such as yohimbine for xylazine.

Lethal Methods

Lethal methods are often most appropriately implemented by trained and certified WS-California personnel. Firearms are often used in conjunction with non-lethal methods to attract the animal to an area or to capture the animal until personnel arrive. Methods used to attract or capture predators prior to lethal removal by firearm include calling, cage traps, foot/leg snares, padded-jaw foot-hold traps, and trained dogs. Additionally, other lethal methods, such as body grip (quick kill) traps, may be used to remove wildlife that is causing damage.

Shooting

Firearms are used to selectively remove individual animals. Shooting to selectively remove individual animals is a very specific method and a properly placed gunshot can cause immediate insensibility and a humane death (American Veterinary Medical Association (AVMA) 2020 as cited in USDA 2022). Wildlife Services-California personnel kill animals as quickly and humanly as possible; under some conditions a gunshot may be the only practical method of euthanasia (AVMA 2020 as cited in USDA 2022). This method is selective for target species.

All applicable firearm safety precautions, laws, and regulations governing the use of firearms are followed by WS-California when conducting IWDM activities. To ensure WS-California personnel receive uniform firearms safety training, National Rifle Association (NRA) certified instructors and the NRA’s curriculum for the basic pistol, rifle, and shotgun certifications are the officially recognized program for initial WS-California firearms safety training. Wildlife Services-California personnel will receive updated training per the Wildlife Services Firearms Safety Training Manual.

Wildlife Services-California personnel commonly use firearms in combination with other techniques and/or modifications such as calling and night shooting. Only non-lead (non-toxic) ammunition (including shot and pellets) will be used on this project due to California State law (AB711) and subsequent regulations promulgated by the California Fish and Game Commission. Firearms create high intensity sound for short durations. When possible, without reducing the effectiveness of the methods, WS-California use suppressors (silencers) and specific ammunition (subsonic) to minimize the audio report of firearms. Suppressors and subsonic ammunition are most used with rifles. Shotguns cannot always be suppressed without affecting shot pattern and/or shooting accuracy.

Body Grip (Quick kill) Traps

Body grip traps are frequently used to lethally remove beaver (*Castor canadensis*). These traps are lethal to targeted and non-targeted species. Within SNRF DPS range, body grip traps used to remove beaver will be set underwater at beaver lodge entrances, underwater travel corridors, near or at a beaver dam or other beaver activity. Set types generally preclude capture of non-target species.

Conservation Measures

Wildlife Services-California has established several conservation measures to minimize/avoid impacts to SNRF DPS individuals when conducting IWDM with the range of the species (USDA 2022). These are:

• Wildlife Services-California personnel will maintain communication with agencies and entities that keep track of locations of SNRF detections and den sites. Wildlife Services-California will use information that these entities share on SNRF locations and den sites to determine trap location and selection.
• Wherever applicable, one-way door excluders and chemical repellents will be used to alleviate wildlife damage in structures.
• Cage traps will only be set near homes or buildings which are disturbed sites and are locations where SNRF are unlikely to frequent.
• Cage traps set for skunks (*Mephitis mephitis*, *Spilogale gracilis*) will be tube traps. These traps have a 6-inch diameter opening, and it is less likely that a SNRF would enter the trap.
• Body grip traps will only be set submerged in water where a SNRF is unlikely to encounter them.
• Snares and Collarum TM devices will be equipped with a stop device unless the snare is set underwater for beaver. Field placement will be carefully considered to reduce the chances of catching non-target animals. Use of a stop on equipment will minimize impacts to non-target animals.
• The pan tension on padded-jaw foothold traps and foot snares will be set at 5 pounds to exclude SNRF when set above 6,000 feet.
• Culvert traps will utilize a trip wire set at a height such that a smaller animal such as a SNRF would pass under the trigger and not release the door, which would capture it.
• Tracking and trailing dogs are trained by WS-California not to pursue species other than the targeted species [*e.g.*, mountain lions (*Puma concolor*), bobcats (*Lynx rufus*)].

• To prevent the potential spread of diseases from the tracking and trailing hounds to wildlife, all hounds will be vaccinated and boosted as needed for canine distemper, canine adenovirus type 1 and 2, canine parainfluenza, canine parvovirus and four types of Leptospira (*L. canicola*, *L. grippotyphosa*, *L. icterohaemorrhagiae*, and *L. pomona*) using a commercially available combination vaccination and vaccinated and boosted for rabies.

Effects of the Project on the Sierra Nevada Distinct Population Segment of the Sierra Nevada Red Fox

Direct impacts to the SNRF DPS from the proposed action would be unlikely due to:

(1) Wildlife Services-California actions related to IWDM will be infrequent within the range of the SNRF DPS and it is not a target species; (2) the selection and implementation of devices, their minimizing measures, and exclusionary features for non-targeted species by trained WS-California personnel would make them unlikely to be encountered by SNRF DPS individuals, (3) WS-California personnel using shared information regarding SNRF DPS locations and den sites and the avoidance of these areas for IWDM activities; (4) any noise disturbance from personnel, vehicles, horses/mules, dogs, or control methods *(i.e.*, firearms) that result in movements by SNRF DPS individuals would be minimal, and (5) dogs being trained to ignore non-target animals and being under the supervision of WS-California personnel. All dogs will be fully vaccinated to prevent risk of disease transmission to SNRF DPS individuals.

Indirect effects of the proposed action to SNRF DPS individuals would be beneficial. This would be due to the removal of predators that may negatively affect SNRF DPS population numbers.

Critical habitat has not been designated for the SNRF DPS. Therefore, the action will not result in the destruction or adverse modification of critical habitat.

Conclusion

The Service has reviewed the project description in your request to consult, and we concur with your determination that the proposed project may affect, but is not likely to adversely affect the SNRF DPS. Our concurrence is based on the project description and accompanying effects analysis provided by your agency.

This concludes informal consultation on the proposed project under regulations promulgated in 50 CFR Part 402, which establish procedures governing interagency consultation under section 7 of the ESA. This informal consultation does not authorize incidental take of SNRF DPS individuals. If this action changes from the description provided, or if new biological information becomes available concerning listed or candidate species which may be affected by the action, your agency should contact our office regarding reinitiating consultation with the Service.

Please reference File No. 2022-0073553 in any future correspondence concerning this consultation. If you have any questions or require additional information, please contact me or Marcy Haworth at (775) 861-6300. Please note, we accept official correspondence at RFWOmail@fws.gov.

Sincerely,

DANIEL COX Digitally signed by DANIEL COX Date: 2022.09.12 15:50:28 -07'00'

Dan Cox
Acting Field Supervisor

cc:
Division Manager, Sierra Cascades Division, U.S. Fish and Wildlife Service, Sacramento, California (Attn: S. Eyes)

Literature Cited

U.S. Department of Agriculture (USDA). 2022. Effects of Wildlife Services Integrated Wildlife Damage Management on the Sierra Nevada DPS of the Sierra Nevada Red Fox in California. Sacramento, California. 26 pp.

AMENDMENT TO

BIOLOGICAL ASSESSMENT

USDA Animal and Plant Health Inspection Service,
California Wildlife Services Program

Part II
Integrated Wildlife Damage Management
To Protect Livestock, Property, Human Health and Safety,
and Natural Resources

In the State of California

Prepared by:
U. S. Department of Agriculture,
Animal and Plant Health Inspection Service
APHIS-WS, Sacramento, California

Revised September 30, 2015

PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this amended Biological Assessment (BA) is to update the evaluation of the effects of the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS) livestock, human health and safety, property, and natural resource protection program in the State of California, on the continued existence of Federally listed mountain yellow-legged frog, Yosemite toad, Sierra Nevada yellow-legged frog, Oregon spotted frog and the yellow-billed cuckoo which may be in the project area or that may be affected by activities occurring within the project area. This BA is attached to Part I which consider programs which are specifically developed to protect listed species from predation or other threats. Those activities are distinct and are therefore considered separately.

CONSULTATION HISTORY

In 1997 USFWS completed four separate APHIS-WS District level informal consultations pursuant to ESA reviewing its wildlife damage management program to protect livestock, human health and safety, property, and natural resource in the State of California.

On August 23, 2002, APHIS-WS requested informal consultation to update earlier consultations.

On December 8, 2003, APHIS-WS submitted a new informal consultation with updated information.

On July 8, 2004, WS requested Formal Section 7 consultation on all of its programs and rescinded the prior requests for informal consultation. The BA was divided into two parts: Part I reviewed a program to protect threatened and endangered species from predation in California; and Part II reviewed the wildlife damage management program to protect livestock, human health and safety, property, and natural resource in the State of California

On May 2007 USFWS completed Part II, Informal Consultation on the APHIS-WS wildlife damage management program to protect livestock, human health and safety, property, and natural resource in the State of California.

September 8, 2008 Wildlife Services submitted an amendment to USFWS to update its July 8, 2004 request (relating to Part II and the May 2007 correspondence).

April 8, 2009. Wildlife Services submitted an updated BA to USFWS to update its July 8, 2004 request (relating to Part I).

May 9, 2012 Wildlife Services submitted an amendment to USFWS to update its September 8, 2008 amendment.

This May 29, 2015 updates the May 9, 2012 submission.

We request completion on both Parts I and II of our request for consultation.

PROPOSED ACTION

Project Area

The analysis area of this amended BA includes occupied habitat of the mountain yellow-legged frog, Yosemite toad, Sierra Nevada yellow-legged frog, Oregon spotted frog and the yellow-billed cuckoo. If and when recognized occupied ranges of these species expand, the analysis area and any agreed upon measures which result from this ESA Section 7 consultation would include those new areas.

As stated in Part II APHIS-WS operational activities are conducted only after a request is received for assistance in resolving a wildlife damage situation and only after a thorough investigation has been conducted to identify the species responsible for the damage. The goal of APHIS-WS operational activities is to reduce or eliminate further damage. The APHIS-WS program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis. None of the proposed activities will result in habitat modification.

General Discussion

The May 8, 2007 consultation on Part II of the APHIS-WS BA discusses APHIS-WS' proposed action to use the full range of authorized wildlife damage management methods in accordance with APHIS-WS Directives (Part II, Appendix A). This amendment focuses on the discussion of mountain yellow-legged frog, Yosemite toad, Sierra Nevada yellow-legged frog, Oregon spotted frog and the yellow-billed cuckoo and the full range of authorized wildlife damage management methods in California.

Existing Condition

During previous informal consultations with the UFSWS[1] APHIS-WS noted that the range of operational wildlife damage management activities conducted was on less than 3.1 to 10.3 percent of the area of lands under which we had cooperative agreements. We do not anticipate substantial changes (either increase or decrease) in the amount of acreage where activities are conducted since APHIS-WS's last consultation with the FWS.

EFFECTS OF PROPOSED ACTION

The primary potential for impacts on any listed species would be associated with accidental injury or death of a non-target mountain yellow-legged frog, Yosemite toad, Sierra Nevada yellow-legged frog, Oregon spotted frog and the yellow-billed cuckoo due to efforts to control

[1] FWS reference numbers 1-1-97-I-1579, 1-1-97-I-831, 1-1-97-I-98 and 1-96-I-1795

predation on livestock by predators and during efforts to reduce other damage caused by wildlife such as bird strike hazards at airports, damage to property, threats to human health and safety, and other damage.

EFFECTS OF THE PROPOSED ACTION ON INDIVIDUAL SPECIES

We are providing the information on "no effect" determinations below relating to newly listed species for your information.

AMPHIBIANS

Oregon Spotted Frog (*Rana pretiosa*) (Federally Threatened 9/29/14). The Oregon spotted frog inhabits emergent wetland habitats in forested landscapes, although it is not typically found under forest canopy (USFWS 2014). It historically occurs in Modoc County, Shasta County, and Siskiyou County. The Oregon spotted frog is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the Oregon spotted frog. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which do not normally harbor frogs coexisting with coyotes. Therefore, the proposed activities will have **no effect on the Oregon spotted frog**. .

Yosemite toad *(Anaxyrus canorus)* - (Federally Endangered 6/30/14). The Yosemite toad is endemic to California. It occurs only in the Sierra Nevada, historically from the Blue Lakes region north of Ebbetts Pass (Alpine County) and the vicinity of Grass Lake (Eldorado County) southward to south of Kaiser Pass and to Evolution Lake in Kings Canyon National Park (Fresno County), at elevations 1,460-3,630 meters (mostly above 2,740 meters) (Stebbins 2003, Davidson and Fellers 2005, USFWS 2013). Its occupied range includes Mono County, Madera County, Fresno County, Tulare County and Inyo County. Habitat includes moist mountain meadows and borders of forests. Individuals shelter in rodent burrows as well as in dense vegetation (IUCN 2004). The Yosemite toad is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the Yosemite toad. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which do not normally harbor toads coexisting with coyotes. Therefore, the proposed activities will have **no effect on the Yosemite toad.**

Mountain Yellow-legged Frog - *Northern California Population (Rana muscosa)* - (Federally Endangered 06-30-2014). The yellow-legged frog is associated with montane streams, lakes, and ponds. It prefers montane riparian areas and can also be found in lodge pole pine, subalpine conifer and wet meadow habitats. The yellow-legged frog is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the yellow-legged frog. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which do not normally occur in wet/moist areas associated with the mountain yellow-legged frog, and do not normally harbor frogs coexisting with coyotes. APHIS-WS will have **no effect on the mountain yellow-legged frog.**

Sierra Nevada Yellow-legged Frog (*Rana sierrae***)** - (Federally Endangered 06-30-2014). The Sierra Nevada yellow-legged frog proposed critical habitat occupies Lassen County, Butte County, Plumas County, Sierra County, Nevada County, Placer County, El Dorado County, Amador County, Calaveras County, Alpine County, Tuolumne County, Mono County, Mariposa County, Madera County, Fresno County, and Inyo County. The Sierra Nevada yellow-legged frog is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the Sierra Nevada yellow-legged frog. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which do not normally occur in wet/moist areas associated with the mountain yellow-legged frog, and do not normally harbor frogs coexisting with coyotes. APHIS-WS will have **no effect on the Sierra Nevada yellow-legged frog**.

<u>BIRDS</u>

Yellow-billed Cuckoo (*Coccyzus americanus)* - (Federally Threatened 11/3/2014). The yellow-billed cuckoo's range includes Northern California from Modoc County west to Del Norte County and south to Mendocino County and in southern California from Santa Cruz County south to Los Angeles County. It inhabits forest, woodland, and scrub environments and arrives in California's breeding grounds usually in early June (Biosystems Analysis 1989). Its presence has also been documented at the Butte Sink Wildlife Management Area, Sacramento River National Wildlife Refuge, and the Sutter National Wildlife Refuge (USFWS 2015). APHIS-WS conducts operational field activities for wildlife damage management and for the prevention of bird strike hazards to aircraft throughout the state; however, APHIS-WS conducts a discountable amount of wildlife damage management activities in the core area of breeding territory of yellow billed cuckoos.

Evaluation of Methods

Wildlife Management - Capture or Take Methods

Live traps generally allow target bird species to enter inside the trap but prevent them from exiting the trap. Birds live-captured in traps could be released on site, translocated or euthanized. Live traps include:

Bow nets are normally used for raptors but may also be used for European Starlings, shorebirds, and other species using visual bait and/or conspecific decoys. Bow nets are remotely triggered from a nearby observation site. Once the net is triggered, the net envelopes the target birds inside the net similar to a suitcase when closed. Bow nets would have no direct effect on yellow-billed cuckoo because positive target species identification is made before an animal is captured. APHIS-WS concludes the use of bow nets will have **no effect on the yellow-billed cuckoo**.

Drop nets could be suspended over a pre-baited site and manually or remotely triggered to drop on target animals or manually dropped on target birds from a high site such as a bridge or rooftop. Decoys may also be used to enhance the effectiveness of drop nets. Drop nets would have no direct effect on yellow-billed cuckoo because positive target species identification is made before an animal is captured. APHIS-WS concludes the use of drop nets will have **no effect on the yellow-billed cuckoo**.

Cannon nets are normally used for larger birds, such as geese or pigeons and use mortar projectiles or compressed air to propel a net up and over birds that have been baited to a particular site. Cannon nets would have no direct effect on yellow-billed cuckoo because positive target species identification is made before an animal is captured. APHIS-WS concludes the use of cannon nets will have **no effect on the yellow-billed cuckoo**.

Foothold traps could be employed to live-capture birds, primarily raptors. Johnson (1994) found that trapping with modified foothold traps could be effective in areas where a small resident crow population is present. No. 0 or 1 foothold traps with padded jaws were used to trap individual birds in areas habitually used by crows. Foothold traps could also be used atop poles to capture raptors. Pole traps are designed to live-capture raptors as they land atop a pole to perch. When landing atop the pole, raptors are captured in modified foothold traps. Traps are attached to a guide wire that runs from the trap down the pole to the ground. Once live-captured by the foothold traps, the trap and raptor slide down the guide wire to the ground for handling. Traps would be monitored a minimum of twice each day to ensure raptors captured were addressed timely. Foothold traps incorporate pan tension devices which preclude the capture of smaller non-target animals such as the yellow-billed cuckoo. APHIS-WS concludes the use of footholds will have **no effect on the yellow-billed cuckoo**.

Net guns/launchers are normally used for flocking birds such as waterfowl and European Starlings. They use a firearm blank or compressed air to propel a weighted net up and over birds, which have been baited to a particular site or birds that do not avoid people. Net guns are manually discharged while net launchers are remotely discharged from a nearby observation site. Net guns/launchers would have no direct effect on yellow-billed cuckoo because positive target species identification is made before an animal is captured. APHIS-WS concludes the use of net guns/launchers will have **no effect on the yellow-billed cuckoo**.

Raptor traps are varied in form and function and includes but is not limited to Bal-chatri, Dho Gaza traps, Phai hoop traps, and Swedish Goshawk traps. These traps could be used specifically to live-trap raptors. Raptor traps incorporate some kind of pan tension devices or loop structures which preclude the capture of smaller non-target animals such as the yellow-billed cuckoo. APHIS-WS concludes the use of raptor traps will have **no effect on the yellow-billed cuckoo**.

Funnel traps could be used to live-capture waterfowl. Traps are set up in shallow water and baited. Funnel traps allow waterfowl to enter the trap but prevents the ducks from exiting. Traps would be checked regularly to address live-captured waterfowl. Captured ducks can be released on site, relocated or euthanized. The proper placement of funnel traps in shallow water limits non-target take, precluding the capture of yellow-billed cuckoo. APHIS-WS concludes the use of funnel traps will have **no effect on the yellow-billed cuckoo**.

Snares made of wire or cables are among the oldest WDM tools and are generally not affected by inclement weather. Snares positioned to capture medium to large mammals around the body can be a useful live-capture device, but they are more often used in conjunction with euthanasia. Snares, usually consisting of 1/16" to 5/64" wire or cable, can be effectively used wherever a target animal moves through a restricted lane of travel (*e.g.*, trails through vegetation). Snare sets naturally exclude incidental take because yellow-billed cuckoos are too small to trigger the device. The catch-pole snare is used to capture or safely handle problem animals. This device consists of a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite of the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. Catch poles are used primarily to remove live animals from traps without danger to or from the captured animal. Catch poles would have no direct effect on yellow-billed cuckoo because positive target species identification is made before an animal is removed.

APHIS-WS snare use is discountable due to the inability of the yellow-billed cuckoo being caught by a snare and therefore poses no threat to yellow-billed cuckoo. APHIS-WS concludes the use of snares will have **no effect on the yellow-billed cuckoo**.

Mist nets are more commonly used for capturing small-sized birds but can be used to capture larger birds, such as ducks and smaller raptors. It was introduced into the United States in the 1950s from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines the bird species that could be caught and overlapping pockets in the net cause birds to entangle themselves when they fly into the net. APHIS-WS use of mist nests is primarily indoors for the capture of invasive species for the protection of public health and safety. Mist net use by APHIS-WS is discountable due the minimal use; therefore, APHIS-WS concludes that mist nets use for wildlife damage management activities **are not likely to adversely affect the yellow-billed cuckoos**.

Decoy traps are similar in design to the Australian Crow Trap as reported by McCracken (1972) and Johnson and Glahn (1994) or typical pigeon traps. Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water and shelter to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds, which enter the trap through one-way doors and are unable to exit. Active decoy traps are monitored daily to remove and euthanize excess birds and to replenish bait and water. Decoy traps are checked daily which would allow for the release of any non-target animals. Decoy traps will not be used in contiguous riparian habitat covering 50 or more acres in occupied habitat to avoid any take of the yellow-billed cuckoo. APHIS-WS concludes that decoy traps for wildlife damage management activities are **not likely to adversely affect the yellow-billed cuckoos**.

Cage and Corral Traps come in a variety of styles for WDM to target different species. The most common traps used in the current program are cage traps. Cage traps are usually rectangular, made from wood or heavy gauge wire mesh. These traps are used to capture animals alive and can often be used where many lethal tools would be too hazardous. Cage traps are well suited for use in residential areas. Cage traps usually work best when baited with foods attractive to the target animal. They are used to capture animals ranging in size from mice to deer, but are usually impractical in capturing most large animals. They are highly effective and most often used in the urban environment for raccoon, skunk and opossum. Cage traps must be checked frequently to ensure that captured animals are not subjected to extreme environmental conditions and non-target animals are released.

Other types of cage traps are corral traps and drive-traps. Often, feral swine are allowed to feed in a suitable sized cage trap until they get used to coming and going. A trip wire that closes the entrance, a one-way door, or other device is set to capture the feral swine when they come to feed. Large cage traps work well for capturing low numbers of feral swine. Corral style traps are large enough to hold multiple animals and will be utilized in areas frequented by feral swine. Traps are set to avoid resource damage within areas of sensitive biological, cultural, or watershed resources.

APHIS-WS use of cage and corral traps is discountable in regard to its impact on yellow billed cuckoo's as their use for wildlife damage management activities is on an as-needed basis; and APHIS-WS adheres to all Federal, State and local laws; and APHIS-WS adheres to rules set forth in cooperative MOUs with land management agencies; and site access activities would be insignificant. APHIS-WS concludes that corral or cage style traps for wildlife damage management activities are **not likely to adversely affect the yellow-billed cuckoos**.

AERIAL OPERATIONS– SHOOTING

Aerial shooting is primarily used for the protection of livestock from coyote depredation. Shotguns are the primary firearm used for aerial shooting to remove target predators and are only effective in open areas where brush and trees do not limit visibility. The presence of vegetation precludes aerial hunting as a technique in contiguous riparian habitat. Aerial shooting is virtually 100 % target selective, therefore will pose no direct threat of injury to yellow-billed cuckoo. Generally, aerial shooting occurs during the winter and early spring months prior to yellow-billed cuckoo migrations, further limiting their exposure to WS aerial operations. The disturbance of yellow-billed cuckoos from aerial shooting operations is discountable because aerial shooting operations avoid riparian areas due to ground visibility restrictions.

Noise disturbance due to aircraft engine noise is discountable because of infrequent flights over riparian areas.

General Considerations: A number of studies have looked at responses of various wildlife species to aircraft overflights. The National Park Service (1995) reviewed studies on the effects of aircraft overflights on wildlife. The report summarized a number of studies have documented responses by certain wildlife species that suggest adverse impacts might occur. Few, if any studies, have proven that aircraft overflights cause significant adverse impacts on populations, although the report stated it is possible to draw the conclusion that impacts to wildlife populations are occurring. It appears that some species will frequently or at least occasionally show adverse responses to even minor overflight occurrences. In general, it appears that the more serious potential impacts occur when overflights are frequent such as hourly and over long periods of time which represents "chronic exposure." Chronic exposure situations generally involve areas near commercial airports and military flight training facilities.

Several examples of wildlife species that have been studied with regard to low-level flights are available in the literature. Grubb et al. (2010) evaluated golden eagle response to civilian and military (Apache AH-64) helicopter flights in northern Utah. Study results indicated that golden eagles were not adversely affected when exposed to flights ranging from 100 to 800 meters along, towards and from behind occupied cliff nests. Eagle courtship, nesting and fledging were not adversely affected, indicating that no special management restrictions were required in the study location.

It was reported that low level overflights of 2-3 minutes in duration by a fixed-wing airplane and a helicopter produced no "drastic" disturbance of tree-nesting colonial waterbirds, and, in 90% of the observations, the individual birds either showed no reaction or merely looked up (Kushlan 1979). Conomy et al. (1998) quantified behavioral responses of wintering American black ducks (*Anas rubripes*), American wigeon, gadwall and American green-winged teal) exposed to low-level flying military aircraft in North Carolina and found that only a small percentage (2%) of the birds reacted to the disturbance. They concluded that such disturbance was not adversely affecting the time-activity budgets of the species. Krausman et al. (1986) reported that only 3 of 70 observed responses of mule deer to small fixed-wing aircraft overflights at 150 to 500 feet above ground resulted in the deer changing habitats. These authors felt that the deer may have been accustomed to overflights because the study area was near an interstate highway which was followed frequently by aircraft.

Krausman et al. (1983) reported that, in 32 observations of the response of bighorn sheep to low-level flights by small fixed-wing aircraft, 60% resulted in no disturbance, 21% in “slight” disturbance, and 19% in “great” disturbance. However, in this study, researchers made up to 10 passes directly above the surveyed animal which is a much higher level of impact than the limited flights that WS would make focusing on the swine. When Krausman et al. (1986) evaluated the effects of simulated low-altitude jet aircraft noise on desert mule deer (*Odocoileus hemionus crooki*) and mountain sheep (*Ovis canadensis mexicana*), they found that heart rates of the ungulates increased according to the dB levels, with lower noise levels prompting lesser increases. When they were elevated, heart rates rapidly returned to pre-disturbance levels suggesting that the animals did not perceive the noise as a threat. Responses to the simulated noise levels were found to decrease with increased exposure. Fancy (1982) reported that only two of 59 bison (*Bison bison*) groups showed any visible reaction to small fixed-wing aircraft flying at 200-500 feet above ground. The study indicated bison are relatively tolerant of aircraft overflights. Andersen et al. (1989) conducted low-level helicopter overflights directly at 35 red-tailed hawk (*Buteo jamaicensis*) nests and concluded their observations supported the hypothesis that red-tailed hawks habituate to low level flights during the nesting period. Their results also showed similar nesting success between hawks subjected to such overflights and those that were not. White and Thurow (1985) did not evaluate the effects of aircraft overflights, but showed that ferruginous hawks (*B. regalis*) are sensitive to certain types of ground-based human disturbance to the point that reproductive success may be adversely affected. However, military jets that flew low over the study area during training exercises did not appear to bother the hawks, and neither were they alarmed when the researchers flew within 100 feet in a small fixed-wing aircraft (White and Thurow 1985). White and Sherrod (1973) suggested that disturbance of raptors by aerial surveys with helicopters may be less than that caused by approaching nests on foot. Ellis (1981) reported that 5 species of hawks, 2 falcons, and golden eagles were “incredibly tolerant” of overflights by military fighter jets, and observed that, although birds frequently exhibited alarm, negative responses were brief and never limiting to productivity. Further reassuring, the considerable analyses of the Air National Guard (1997*a*, 1997*b*) show that, despite considerable research on numerous wildlife species, no scientific evidence exists that indicates any substantive adverse effects on wildlife populations will occur as a result of any of the types of low-level or other overflights that do or may occur.

It is very unlikely that the engine noise resulting from aerial shooting will disturb the yellow-billed cuckoo due to the unlikely occurrence of flights over contiguous riparian habitat

Given the information above; that APHIS-WS aerial shooting poses no direct threat to yellow-billed cuckoo; that most aerial shooting operations for the protection of livestock occurs prior to yellow-billed cuckoo migrations, over open ground habitats and that any disturbances by aerial shooting would be discountable. APHIS-WS concludes the uses of aerial shooting are **not likely to adversely affect the yellow-billed cuckoo**.

GROUND SHOOTING

Ground shooting is used in conjunction with calling, stalking, and night vision and is used for the removal of individual offending animals that cause damage in areas that may be occupied by yellow-billed cuckoo. Shooting would have no direct lethal effect on yellow-billed cuckoo because positive target species identification is made before an animal is removed. Thus, APHIS-WS use of ground shooting has been and is expected to be virtually 100% selective for target species, and would not pose a significant lethal risk to yellow-billed cuckoo. Gunshot noise disturbance is discountable since APHIS-WS uses suppressed firearms which produce insignificant sound reports and the large majority of ground shooting work is outside the core area for yellow billed cuckoos. Therefore, APHIS-WS determines that ground shooting is insignificant and is **not likely to adversely affect the yellow-billed cuckoo**.

SCARE DEVICES

Propane Exploders

Propane exploders are primarily used by APHIS-WS at airports for the protection of public health and safety. The use of propane exploders outside airport environments is rare and extremely localized and discountable. The sound reports of propane cannons may be heard from great distances, but this disturbance would be discountable since aircraft produce sound reports at a much greater frequency and duration.

Given that APHIS-WS use of propane cannons poses no direct physical threat to yellow-billed cuckoo; the use of propane cannons for wildlife depredation activities are on a limited basis; APHIS-WS concludes the use of propane cannons would be discountable and is **not likely to adversely affect the yellow-billed cuckoo**.

Pyrotechnics

Pyrotechnics are primarily used by APHIS-WS at airports for the protection of public health and safety. The use of pyrotechnics outside airport environments is rare and extremely localized and discountable. Any use outside airport environments would not be in contiguous riparian habitat. Pyrotechnics may pose a fire danger in vegetated areas and would not be used in continuous riparian habitat.

APHIS-WS use of pyrotechnics poses no direct physical threat to yellow-billed cuckoo, and are used primarily at airports and on a limited geographical basis outside of airport environments, APHIS-WS therefore concludes the use of pyrotechnics would be discountable and is **not likely to adversely affect the yellow-billed cuckoo**.

Other Scare Devices (Alarm or Distress Calls, Predator Effigies, Raptor Models,

Drones, etc.)

Other scare devices are primarily used by APHIS-WS at airports for the protection of public health and safety and pose no direct lethal threat. Their use is extremely localized and discountable outside airport environments. Any use outside airport environments would not be in contiguous riparian habitat.

Some scaring devices can produce both visual and audible effects that may be observed and/or heard from a distance. The disturbance from sound reports of other scare devices would be discountable due to the infrequency of use and duration.

Given that APHIS-WS use of scare devices poses no direct physical threat to yellow-billed cuckoos; the use of scare devices for the protection of public health and safety activities is on a limited basis; APHIS-WS concludes scare devices use is discountable and is **not likely to adversely affect the yellow-billed cuckoo**.

TRAINED DOGS

Trained dogs may be used to track or decoy predators in areas occupied by yellow-billed cuckoos. Trained dogs, when used as decoys, lure predators into shooting range for removal. Tracking dogs are used to follow the scent trails of target animals. Yellow-billed cuckoo habitat is distributed over a small portion of California and APHIS-WS does not currently cooperatively work in Tehama or Glenn counties; APHIS-WS discountable amount of activity in yellow-billed cuckoo habitat would have an insignificant effect yellow-billed cuckoo.

Given that APHIS-WS' use of trained dogs is discountable in relation to disturbances to yellow-billed cuckoo, APHIS-WS concludes the use of trained dogs is **not likely to adversely affect yellow-billed cuckoo.**

SITE ACCESS (PICKUP TRUCK, ATV, MOTORCYCLE, SNOWMOBILE, AIRCRAFT AND HORSEBACK RIDERS)

APHIS-WS may use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, aircraft or horses in occupied yellow-billed cuckoo habitat primarily in agricultural areas at the request of cooperators. Site access would be limited to existing roads and trails, as much as feasible, and cross country vehicle travel is prohibited in wilderness areas, wilderness study areas, and other special management areas. APHIS-WS conducts a discountable amount of wildlife damage management activities in the core area of breeding territory of yellow billed cuckoos. Agriculture areas are frequented by farmers and equipment, where vehicle travel is not uncommon. APHIS-WS activity in these areas would be less disruptive than the agricultural activity in the area. Yellow-billed cuckoo living in high activity areas may become more habituated to agricultural activity, as in the case of nests established in active orchards. APHIS-WS activities would not be directed at yellow-billed cuckoos and the amount of time APHIS-WS personnel spend accessing riparian areas during nesting season would be so minimal as to be discountable. All APHIS-WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in APHIS-WS MOUs with land management agencies, and in other agreements with land owners.

APHIS-WS concludes that site access for wildlife damage management activities would be insignificant and are **not likely to adversely affect the yellow-billed cuckoos.**

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Southwest Region
2800 Cottage Way, Suite W-2606
Sacramento, California 95825

In Response Reply To:
08ESMF00-2016-I-0001

DEC 15 2015

Dennis Orthmeyer
State Director, California Office
Animal and Plant Health Inspection Service, Wildlife Services
U.S. Department of Agriculture
3419A Arden Way
Sacramento, California 95825

Subject: Informal consultation on USDA APHIS California Wildlife Services Program Part II for yellow-billed cuckoo

Dear Mr. Orthmeyer:

On May 29, 2015, we received your draft letter requesting initiation of informal consultation on the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) California Wildlife Services (WS) Program Part II, in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Part II of your program addresses integrated wildlife damage management to protect livestock, property, human health and safety, and natural resources. You determined that the proposed actions are not likely to adversely affect the federally threatened yellow-billed cuckoo (*Coccyzus americanus*; cuckoo) and requested our concurrence with that determination.

Our analysis is based on information provided in the *Amendment To Biological Assessment, USDA Animal and Plant Health Inspection Service, California Wildlife Services Program Part II: Integrated Wildlife Damage Management to Protect Livestock, Property, Human Health and Safety, and Natural Resources in the State of California* (BA), revised September 30, 2015; additional information about your program during a meeting on September 1, 2015; and correspondence, notes and information compiled during the course of our consultation on the subject project. This letter supplements our previous concurrences on this program dated May 8, 2007 and April 14, 2014.

Proposed Action

The APHIS-WS program consists of responding to requests for assistance to protect livestock, crops, human health and safety, and property from wildlife damage on localized tracts of private and public land.

Assistance by APHIS-WS includes providing technical assistance, conducting investigations to identify the species responsible for the damage, and resolving wildlife damage situations through conducting management/operational actions on a temporary basis.

Technical assistance includes advice, recommendations, information, and materials provided by APHIS-WS employees for others to use in managing wildlife damage problems. APHIS-WS normally does not implement these methods but recommends them to producers and property owners or managers. The Service has determined that providing this type of technical assistance does not constitute a federal action subject to section 7 of the Act because APHIS-WS is not authorizing, funding, or carrying out any activities that may affect listed species or critical habitat. Therefore, this technical assistance is not considered further in this document.

Management actions conducted by APHIS-WS are targeted at coyotes, black bears, mountain lions, bobcats, red fox, gray fox, beavers, muskrats, raccoons, striped and spotted skunks, opossums, weasels, badgers, marmots, feral pigs, feral dogs, feral cats, ravens, blackbirds, crows, starlings, gulls, raptors, pigeons, waterfowl, and other species that cause damage. Management control actions conducted by APHIS-WS also include the prevention of bird strike hazards to aircraft throughout the State of California. APHIS-WS uses the following wildlife damage management techniques in California:

a. Nonlethal methods: exclusion, harassment (mist nets, decoy traps, cage and corral traps, propane exploders, pyrotechnics, vehicle harassment, spotlighting harassment, effigies, dog harassment, bioacoustics), soft catch leghold and foothold traps, cage traps, leg snares, alpha-chloralose, raptor traps, trail and decoy dogs.
b. Lethal non-chemical methods: aerial shooting, ground shooting, neck snares, conibear traps, aerial shooting, nest and egg removal
c. Lethal chemical methods: DRC-1339 avicide, gas cartridge, sodium pentobarbital, CO^2, and the M-44 device[1].

The goal of APHIS-WS management control actions is to reduce or eliminate further damage. None of the proposed activities will result in habitat modification. Previously, the range of operational wildlife damage management activities conducted by APHIS-WS was on less than 3.1 to 10.3 percent of the area of lands under which APHIS-WS had cooperative agreements. APHIS-WS does not anticipate substantial changes (either increase or decrease) in the amount of acreage where activities are conducted.

All management control actions and techniques used by APHIS-WS throughout the State of California are being considered in this consultation. The primary potential for impacts on cuckoo are associated with accidental injury or death due to implementation of operational

[1] M-44 devices are not currently authorized for use in California except on Tribal lands. Our analysis only addresses use of the M-44 device on Tribal lands and does not address a more widespread potential future use in California.

management control actions. Only a limited amount of wildlife damage management activities are conducted by APHIS-WS in known cuckoo breeding areas.

Yellow-billed cuckoo

APHIS-WS has determined that the use of mist nets, decoy traps, cage and corral traps, aerial shooting, ground shooting, propane exploders, pyrotechnics, other scare devices, trained dogs, and site access may affect, but are not likely to adversely affect, the cuckoo in California. A short description of each of these activities is provided below.

- **Mist nets:** Mist nets are commonly used for capturing small-sized birds but can be used to capture larger birds, such as ducks and smaller raptors. Mist nets are rarely used by APHIS-WS and primarily used indoors for the capture of invasive species for the protection of public health and safety. It is unlikely that mist nets will be used where cuckoo occur.
- **Decoy traps:** Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water and shelter to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Active decoy traps are monitored daily to remove and euthanize excess birds and to replenish bait and water. Decoy traps are checked daily which would allow for the release of any non-target animals. Decoy traps will not be used in contiguous riparian habitat covering 50 or more acres in occupied habitat to avoid any take of cuckoo.
- **Cage and Corral Traps:** The most common traps used in the current program are cage traps used to capture animals alive and are often used where many lethal tools would be too hazardous. They are most often used in the urban environment for raccoon, skunk and opossum. Corral traps and drive-traps are often used for feral swine. APHIS-WS uses traps on an as-needed basis and sets the traps to avoid resource damage within areas of sensitive biological, cultural, or watershed resources. APHIS-WS adheres to all Federal, State and local laws and rules set forth in cooperative MOUs with land management agencies when using traps.
- **Aerial shooting:** Aerial shooting is primarily used for the protection of livestock from coyote depredation. Shotguns are the primary firearm used for aerial shooting to remove target predators and are only effective in open areas where brush and trees do not limit visibility. Thus, the presence of vegetation precludes aerial hunting as a technique in contiguous riparian habitat. In addition, aerial shooting is target selective, therefore such activity poses no direct threat of injury to cuckoo. Also, aerial shooting generally occurs during the winter and early spring months prior to arrival of migrating cuckoo, further limiting their exposure to WS aerial operations. Since riparian habitat precludes aerial hunting, flights over riparian areas are infrequent.
- **Ground shooting:** Ground shooting is used in conjunction with calling, stalking, and night vision and is used for the removal of individual offending animals that cause damage. Such activities may occur in areas that may be occupied by cuckoo. However, shooting would have no direct lethal effect on cuckoo because positive target species identification is made before an animal is removed. APHIS-WS use of ground shooting

has been and is expected to continue to be target selective, and would not pose a lethal risk to yellow-billed cuckoo. Gunshot noise disturbance is expected to be minimal since APHIS-WS uses suppressed firearms which produce insignificant sound reports.

- **Propane exploders**: Propane exploders are used by APHIS-WS on a limited basis; mostly at airports for the protection of public health and safety. The use of propane exploders outside airport environments is rare and localized. Propane exploders pose no direct physical threat to cuckoo. Sound disturbance from propane cannons is expected to be masked by the greater frequency and duration of aircraft noise.
- **Pyrotechnics:** Pyrotechnics are primarily used by APHIS-WS at airports and on a limited geographical basis outside of airport environments for the protection of public health and safety. The use of pyrotechnics outside airport environments is rare and localized. Pyrotechnics may pose a fire danger in vegetated areas and would not be used in contiguous riparian habitat. APHIS-WS use of pyrotechnics poses no direct physical threat to cuckoo.
- **Other scare devices**: Other scare devices include the following: alarm or distress calls, predator effigies, raptor models, and drones. These devices are primarily used by APHIS-WS on a limited basis at airports for the protection of public health and safety and pose no direct physical or lethal threat to cuckoo. Their use is extremely localized outside airport environments. Some scaring devices can produce both visual and audible effects that may be observed and/or heard from a distance. Disturbance from sound reports of these scare devices are infrequent of short duration. Any use outside airport environments would not be in contiguous riparian habitat.
- **Trained dogs:** Trained dogs may be used to track or decoy predators, primarily mountain lions or bears. It is unlikely that bears would co-occur with yellow-billed cuckoo. Although this method could be used where mountain lions and yellow-billed cuckoo co-occur, the use of trained dogs would be infrequent, particularly during the nesting season when yellow-billed cuckoos are the most sensitive to noise and physical disturbance. Most nests occur at least six feet off the ground, which minimizes the chances of physical disturbance of a nest by a dog traversing through the habitat.
- **Site Access:** Site access by APHIS-WS includes the potential to use 4-wheel drive vehicles, ATVs, motorcycles, snow machines, aircraft or horses in occupied cuckoo habitat primarily in agricultural areas at the request of cooperators. Site access would be limited to existing roads and trails, as much as feasible, and cross country vehicle travel is prohibited in wilderness areas, wilderness study areas, and other special management areas. Agriculture areas are frequented by farmers and equipment, where vehicle travel is not uncommon. APHIS-WS activity in these areas would not be substantially more disruptive than the agricultural activity in the area.

We provide our concurrence based on the following reasoning: 1) APHIS-WS conducts few wildlife damage management activities in known cuckoo breeding areas, and does not conduct activities in Glenn or Tehama counties where much of the remaining yellow-billed cuckoo habitat occurs in California; 2) most activities would not occur within contiguous riparian habitat covering 50 or more acres, and some activities are further restricted to all contiguous riparian habitat; 3) due to the timing of cuckoo migration, some APHIS-WS activities do not occur when cuckoos are present; 4) most APHIS-WS activities are of short duration; 5) APHIS-WS personnel's need to access riparian areas during nesting season is minimal; 6) several APHIS-WS activities occur on airport property where cuckoo breeding is not known to occur; 7) all APHIS-WS site access activities would be in compliance with all Federal, State and local laws, as well as in compliance with the terms and conditions set forth in APHIS-WS MOUs with land management agencies, and in other agreements with land owners; and 9) none of the proposed activities will result in habitat modification.

Thank you for the efforts by you and your staff to work with the Service on this consultation. If you have additional questions or concerns, feel free to contact Jana Affonso of my staff at 916-414-6593.

Sincerely,

Michael Fris
Assistant Regional Director

BIOLOGICAL ASSESSMENT

USDA Animal and Plant Health Inspection Service, California Wildlife Services Program

Part II
Integrated Wildlife Damage Management
To Protect Livestock, Property, Human Health and Safety, and Natural Resources

In the State of California

Prepared by:
U. S. Department of Agriculture,
Animal and Plant Health Inspection Service
APHIS-WS, Sacramento, California

July 8, 2004
Amended February 7, 2007

PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this Biological Assessment (BA) is to update the evaluation of the effects of the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS) livestock, human health and safety, property, and natural resource protection program in the State of California, on the continued existence of Federally listed endangered and threatened species and species proposed for listing, which may be in the project area or that may be affected by activities occurring within the project area. This BA does not consider programs which are specifically developed to protect listed species from predation or other wildlife threats. Those activities are distinct and have been addressed in the BA submitted to USFWS in 2004.

CONSULTATION HISTORY

This BA was prepared to update previous consultations on the effects of the APHIS-WS program in California and supersedes our August, 2002 and December, 2003 requests for informal consultation, and withdraws the informal component (Part II) from the request for consultation for *all* WS programs made on July 8, 2004. This BA provides a review of our livestock, property, agriculture, and human health and safety programs by adding new information from recent listings, a change in program scope, or other potential new program effects. This BA specifically replaces informal consultations that were completed for the five APHIS-WS Districts in California: North District - FWS reference letter 1-1-96-I-1795; Sacramento District - FWS reference letter 1-1-97 I-98; Central District - FWS reference letter 1-1-97-I-831; and the San Luis and South Districts - combined in FWS reference letter 1-1-97-I-1579.

Environmental Assessments (EAs) prepared pursuant to the National Environmental Policy Act and Findings of No Significant Impact were prepared for each of the California APHIS-WS District programs in 1996 and 1997. We are currently in the process of amending the EAs in compliance with the National Environmental Policy Act. The current program alternative continues to be our proposed action alternative. The results of this consultation will be included in the revised EAs.

PROPOSED ACTION

Project Area

The analysis area includes five APHIS-WS Districts. Most effort occurs in counties where APHIS-WS has cooperative agreements in place. However, a request for assistance can occur in any county, therefore, all counties are potentially within the analysis area.

<u>The California APHIS-WS North District</u> includes the following counties where APHIS-WS currently has cooperative agreements: Butte, Glenn, Humboldt, Lassen, Mendocino, Modoc, Nevada, Plumas, Sierra, Siskiyou, Shasta, Sutter, Trinity, and Yuba Counties. The analysis area also includes the Del Norte and Tehama Counties where we anticipate the possibility of entering into cooperative agreements in the near future.

The California APHIS-WS Central District includes the following counties where APHIS-WS currently has cooperative agreements: Alameda, Amador, Calaveras, Contra Costa, Madera, Mariposa, Merced, San Joaquin, Stanislaus, and Tuolumne. The analysis area also includes the following counties where we anticipate the possibility of entering into cooperative agreements in the near future: Alpine, Fresno, Inyo, Kings, Mono, and Tulare.

The California APHIS-WS Sacramento District includes the following counties where APHIS-WS currently has cooperative agreements: Colusa, El Dorado, Lake, Napa, Placer, Sacramento, Solano, Sonoma, and Yolo Counties.

The California APHIS-WS San Luis and South Districts includes the following counties: Kern, Imperial, Los Angeles, Monterey, Orange, Riverside, San Benito, San Bernardino, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, and Ventura. APHIS-WS currently has cooperative agreements in Imperial, Kern, Monterey, San Luis Obispo, San Diego, and Santa Barbara Counties. APHIS-WS does not currently have cooperative agreements in the following 12 counties but we acknowledge a possibility of entering into cooperative agreements in the future: Los Angeles, Orange, Riverside, San Bernardino, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Ventura Counties.

APHIS-WS operational activities are conducted only after a request is received for assistance in resolving a wildlife damage situation and only after a thorough investigation has been conducted to identify the species responsible for the damage. The goal of APHIS-WS operational activities is to reduce or eliminate further damage. The APHIS-WS program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis. None of the proposed activities will result in habitat modification.

General Discussion

APHIS-WS' proposed action is to use the full range of authorized wildlife damage management methods in accordance with APHIS-WS Directives (Appendix A). Proposition 4, a voter initiative, passed in November 1998, has prohibited the use of sodium cyanide and sodium monoflouroacetate, and steel jawed leghold traps in the State of California. Padded leghold trap use is restricted to protecting public health and safety. The U.S. District Court Order Granting Preliminary Declaratory Relief (No. C-98-4610-CAL) allows the use of padded-jaw traps for the protection of endangered species. Lethal wildlife damage management methods that WS can currently use in California include aerial hunting, ground based shooting, neck snares, conibear traps and gas cartridges.

Currently, the APHIS-WS program provides assistance to protect livestock, crops, human health and safety and property from wildlife damage. APHIS-WS' control actions are targeted at offending coyotes, black bears, mountain lions, bobcats, red fox, gray fox, beavers, muskrats, raccoons, striped and spotted skunks, opossums, weasels, badgers, marmots, feral pigs, feral dogs, feral cats, ravens, blackbirds, crows, starlings, gulls, raptors, pigeons, waterfowl, and other species that cause damage. APHIS-WS' approach to wildlife conflict resolution is commonly referred to as integrated wildlife damage management. The APHIS-WS program in California incorporates several control methods and techniques. The specific methods used in California are listed below.

1. APHIS-WS would provide technical assistance to livestock, crop and property managers on cultural practices and aversive tactics. This would be:

a) animal husbandry;
b) use of physical barriers;
c) habitat management and biological control;
d) audio repellants (gas exploders and pyrotechnics) ; and
e) visual repellants (effigies, scarecrows, and other scaring techniques).

Technical assistance is advice, recommendations, information, and materials provided by APHIS-WS employees for others to use in managing wildlife damage problems. APHIS-WS normally does not implement these methods but recommends them to producers and property owners or managers. However, devices such as the electronic guard (a strobe light-siren) or propane exploders are implemented by APHIS-WS to scare and harass predators away from areas needing protection.

2. APHIS-WS would use the following wildlife damage management techniques:

a) non-lethal methods (exclusion, harassment, (pyrotechnics, propane cannons, vehicle harassment, spotlighting harassment, effegies, dog harassment, bioacoustics), leghold traps, cage traps, leg snares, alpha-chloralose, raptor traps, trail and decoy dogs);

b) lethal nonchemical methods (shooting, neck snares, conibear traps, aerial shooting, nest and egg removal); and

c) lethal chemical methods DRC-1339 avicide, gas cartridge, Sodium pentobarbital, CO_2, and the M-44 device. The M-44 device is not authorized for use in California, except on Tribal lands. We have included the M-44 device in the total analysis in case it becomes reauthorized for broader use in California.

Descriptions of all of the methods listed above can be found in Appendix P of the APHIS-WS Final Programmatic EIS, with the exception of CO_2. CO_2 is a colorless, odorless, noncombustible gas approved by the American Veterinary Medical Association (AVMA) as a euthanasia method (Beaver et al. 2001). CO_2 is a common euthanasia agent apparently because of its ease of use, safety, and ability to euthanize many animals in a short time span. The advantages for using CO_2 are: 1) the rapid depressant, analgesic, and anesthetic effects of CO_2 are well established, 2) CO_2 is readily available and can be purchased in compressed gas cylinders, 3) CO_2 is inexpensive, nonflammable, nonexplosive, and poses minimal hazard to personnel when used with properly designed equipment, and 4) CO_2 does not result in accumulation of tissue residues. CO_2 has been used to euthanatize mice, rats, guinea pigs, chickens, and rabbits, and to render swine unconscious before humane slaughter. Studies of 1-day-old chickens have revealed that CO_2 is an effective euthanatizing agent. Inhalation of CO_2 caused little distress to the birds, suppresses nervous activity, and induced death within 5 minutes. In addition, inhalation of CO_2 at a concentration of 7.5% increases the pain threshold, and higher concentrations of CO_2 have a rapid anesthetic effect.

WS sometimes uses CO_2 to euthanize animals which have been captured in live traps, by hand, or by chemical immobilization. Live animals are placed in a container or chamber and CO_2 gas from a cylinder is released into the chamber. The animals quickly expire after inhaling the gas.

Existing Condition

During previous informal consultations with the UFSWS[1] APHIS-WS noted that the range of operational wildlife damage management activities conducted was on less than 3.1 to 10.3 percent of the area of lands under which we had cooperative agreements. We do not anticipate substantial changes (either increase or decrease) in the amount of acreage where activities are conducted since APHIS-WS's last consultation with the FWS.

APHIS-WS has determined that this proposal would have no effect on any listed fish, invertebrate, marine animal, or plant species because it does not affect habitat or does not work in the range of the species. APHIS-WS conducts one project to protect a listed plant species, the purple amole (*Chlorogalum purpureum*), which is being evaluated in a separate consultation on proposals designed specifically to benefit listed species.

EFFECTS OF PROPOSED ACTION

The primary potential for impacts on any listed species would be associated with accidental injury or death of a non-target listed species occurring due to efforts to control predation on livestock by predators and during efforts to reduce other damage caused by wildlife such as bird strike hazards at airports, consumption and contamination of livestock feed, damage to property, threats to human health and safety, and other damage.

EFFECTS OF THE PROPOSED ACTION ON INDIVIDUAL SPECIES

BIRDS

California brown pelican (*Pelecanus occidentalis californicus*) - (Federally Endangered 10/13/70). Pelicans nest and feed in estuarine and marine habitats. APHIS-WS conducts operational field activities for prevention of bird strike hazards to aircraft for the U.S. Navy in San Diego County where the brown pelican may occur. The only work APHIS-WS may do that could affect the brown pelican would be at the request of the U.S. Navy. If the California brown pelican were found to be on or near airport runways and thus creating a potential bird strike hazard, this species would be hazed.

[1] FWS reference numbers 1-1-97-I-1579, 1-1-97-I-831, 1-1-97-I-98 and 1-96-I-1795

Agent Designation: APHIS-WS requests agent designation for approved staff as agents of the Service for the purpose of harassing brown pelicans that constitute a demonstrable threat to aviation safety at United States Navy facilities in San Diego County. Authority for this action is provided under 50 CFR 17.21 and is effective upon signature of the concurrence letter. Pursuant to 50 CFR 17.21(c)(3)(iv) any employee or agent of the Service, who is designated by his agency for such purposes, may take endangered wildlife without a permit if such action is necessary to remove specimens which constitute a demonstrable but non-immediate threat to human safety.

1. As an agent of the Service, in accordance with 50 CFR 17.21(c)(3)(iv), the approved agent(s) is authorized to take by harassment ("hazing") all brown pelicans (*Pelecanus occidentalis*) that pose a collision threat to aircraft. The "hazing" may be accomplished by walking or running toward roosting brown pelicans, use of pyrotechnic devices (e.g., firecrackers), display of effigies, or running trained dogs.

2. At least 30 days prior to implementation of any activities pursuant to this letter, APHIS-WS shall submit to the Service (Vicki Campbell, USFWS, California-Nevada Operations Office, 2800 Cottage Way, W-2606, Sacramento, CA 95825) the name(s) and qualifications of any person(s) proposed to be designated as an "agent" under this letter. These individuals will be subject to the approval of the Service.

3. All activities are restricted to United States Naval facilities in San Diego County.

4. No brown pelicans may be injured or killed by the hazing. In the event that any brown pelican is injured or killed during the authorized activity, the designated agent(s) must:

    a. Immediately cease the method of hazing being employed at the time the death or injury occurred. The method may not be resumed at that location until the circumstances of the death or injury have been investigated. Subsequently, the Service may allow the method to resume, or may revoke or suspend this authorization.

    b. Notify immediately, by phone and in writing, the Ventura Fish and Wildlife Office, at 805-644-1766 and Rick Farris, Section 7 Coordinator, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003.

        - The written report shall describe the circumstances that lead to the death of injury of the brown pelican, and provide suggestions for how the hazing method could be modified to avoid further injury or mortality.

    c. Send dead or injured pelicans to:

        - Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559

Puesta Del Sol, Santa Barbara, California 93460, (805-682-4711, extension 321)

and/or

- Western Foundation of Vertebrate Zoology (Contact: René Corrado, Curator, 439 Calle San Pablo, Camarillo, California, (805-388-9944))

5. This does not authorize the harassment of any other federally endangered or threatened species. In the event any other listed species is present and may be affected by the hazing, the agent shall cease all activities and contact the appropriate Service office, UNLESS the presence of brown pelicans poses an immediate threat to human safety and hazing cannot be avoided. In such cases, hazing may proceed, but the agent must take all steps available to minimize the effects of the hazing on non-target listed species, such as using methods that may target brown pelicans more specifically.

6. The agent(s) shall prepare an annual report to be submitted to Field Supervisor, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003 by January 31 of each year this authorization is in effect. The annual report shall include, at a minimum:

   a. The number of brown pelicans hazed each month. The count should also include an estimate of the non-target species affected, listed or otherwise.

   b. The number of brown pelicans found dead or injured and possible causes for such injury or mortality, including those known to be a result of the hazing activities (even though those events would have been addressed under #3 above).

   c. An analysis of the relative success of each hazing method used. This analysis should focus on specificity of the methods (i.e., which methods worked best on brown pelicans yet avoided hazing non-target species?). It should also include a description of how the hazing methods were implemented.

   d. A list of any other endangered or threatened species observed in the area where hazing was to occur, and whether any hazing activity was halted to avoid affecting non-target listed species.

   e. If no hazing activities occurred over the preceding year, the report should state that and why hazing was not necessary.

7. Failure to comply with the terms and conditions above will result in immediate revocation of this agent designation and may result in non-renewal.

California condor *(Gymnogyps californianus)* - (Federally Endangered 3/11/67) - APHIS-WS will incorporate applicable requirements from it national consultation (in progress) for this species, therefore, this species is not included in this BA.

Short-tailed albatross (*Phoebastria albatrus*) - (Federally Endangered 8/30/00). This species may occur, but has not yet been identified, at Oakland International Airport. WS conducts operational field activities at Oakland International Airport to manage bird strike hazards to aircraft using the airport. Bird hazard management operations permit positive species identification, therefore, this species would not be likely to be adversely affected. If the short-tailed albatross were found to be on or near airport runways and thus creating a potential bird strike hazard, this species would be hazed. Hazing could potentially benefit the short tailed albatross by removing it from the pathways of aircraft. The proposed action is **not likely to adversely affect the short-tailed albatross.**

The following conclusions are based on prior consultations between APHIS-WS and the USFWS remain valid.

Coastal California gnatcatcher *(Polioptila californica californica)* - (Federally Threatened 3/30/93). The coastal California gnatcatcher is an endemic, uncommon resident of the scrub dominated plant communities in coastal California and northwestern Baja California, Mexico. It is found from southern Ventura County southward through Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties. APHIS-WS activities are rare in the occupied habitat of the coastal California gnatcatcher. Because of it's habits and small size, the gnatcather is not susceptible to APHIS-WS control tools. Therefore there is little opportunity for the gnatcatcher to be adversely exposed to any APHIS-WS program activities. The proposed action will have **no effect on the coastal California gnatcatcher.**

San Clemente loggerhead shrike *(Lanius ludovicianus mearnsi)* - (Federally Endangered 8/11/77). The San Clemente loggerhead shrike is a very rare resident of San Clemente Island. APHIS-WS currently does not work on San Clemente Island. The only work APHIS-WS may do on the island would be at the request of the US Navy. This work would not fall under the scope of this assessment. **The proposed activities will have no effect on the San Clemente loggerhead shrike.**

San Clemente sage sparrow *(Amphispiza belli clementeae)* - (Federally Threatened 8/11/77). The San Clemente sage sparrow is a resident of San Clemente Island. APHIS-WS does not currently work on San Clemente Island. The only work APHIS-WS would do on San Clemente Island would be for the protection of the San Clemente loggerhead shrike. This activity is not within the scope of this assessment. The proposed activities will have **no effect on the San Clemente sage sparrow.**

<u>MAMMALS</u>

Peninsular bighorn sheep *(Ovis canadensis cremnobates)* - (Federally Endangered 3/18/98). The Peninsular bighorn sheep occur in the Peninsular Ranges from San Jacinto and Santa Rosa Ranges south into Mexico. APHIS-WS work in the range is currently limited to participation in a research program with the USFWS and CDFG to study the movement of mountain lions in relation to the bighorn sheep. The work of protecting listed species is not within the scope of this assessment. The proposed action is **not likely to adversely affect the Peninsular bighorn sheep.**

Sierra Nevada bighorn sheep (*Ovis canadensis californiana*) **-** (Federally Endangered 1/3/00). Currently five subpopulations occur at Lee Vining Canyon, Wheeler Crest, Mount Baxter, Mount Williamson, and Mount Langley in Mono and Inyo counties, three of which are reintroduced populations. The USFWS has completed a consultation on the effects of the APHIS-WS program on the Sierra Nevada bighorn sheep and concluded that a predator damage management program in its range was not likely to adversely affect the Sierra Nevada bighorn sheep, and that any impacts would likely be beneficial by removing predators. Protection of listed species is not within the scope of this analysis. The proposed activities are **not likely to adversely affect the Sierra Nevada bighorn sheep.**

Point Arena mountain beaver *(Aplodontia rufa nigra)* - (Federally Endangered 12/12/91). The Point Arena mountain beaver is found within a small area of coastal habitat in Mendocino County. The APHIS-WS program does not use or recommend the use of rodenticides within the home range of the Point Arena mountain beaver.   The proposed action does include the use of gas cartridges for coyotes. The use of gas cartridges within the occupied habitats of the Point Arena mountain beaver is limited, by its label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens. If a need arises to use leghold traps or leg snares within the range of the Point Arena mountain beaver, the traps or snares will incorporate a pan tension device to eliminate the capture of smaller non-target animals such as the mountain beaver. Conibear traps would not be used in the mountain beaver range except as underwater sets where mountain beavers would not come in contact with them. Beneficial effects may result from removing coyotes that prey on this species. The proposed action is **not likely to adversely affect the Point Arena mountain beaver.**

San Bernardino Merriam's kangaroo rat *(Dipodomys merriami parvus)* - (Federally Endangered 9/24/98). This species range is limited to southwestern San Bernardino County and western Riverside County. It is normally found in coastal sage and alluvial fan shrub and is associated with sandy substrates where there are plentiful open areas. The proposed action does not include the use of rodenticides or small rodent traps. The proposed action does include the use of gas cartridges for coyote damage management. Much of the range of the San Bernardino Merriam's kangaroo rat overlaps with the Stephen's kangaroo rat. The use of gas cartridges within the occupied habitats of the Stephen's kangaroo rat is limited, by its label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. In addition, APHIS-WS will limit the use of the gas cartridge within all occupied habitat of the San Bernardino Merriam's kangaroo rat to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens where it is unlikely that rodents would be coexisting with coyotes.

If a need arises to use leghold traps or leg snares within the range of the San Bernardino Merriam's kangaroo rat, the traps or snares will incorporate an attached pan tension device to eliminate the capture of all smaller non-target animals such as the kangaroo rat. There is little opportunity for the San Bernardino Merriam's kangaroo rat to be adversely exposed to APHIS-WS program activities. Impacts may be beneficial by removing known predators of the kangaroo rat. Therefore, the proposed activities are **not likely to adversely affect the San Bernardino Merriam's kangaroo rat.**

Riparian (San Joaquin Valley) woodrat *(Neotoma fuscipes riparia)* - (Federally Endangered 3/24/00). The Riparian (San Joaquin Valley) woodrat is a rare resident of the lower San Joaquin Valley. It feeds mainly on woody plants. It does not live in the ground but rather builds houses out of sticks and leaves at the base of, or in a tree, around a shrub, or at the base of a hill.

If a need arises to use leghold traps or leg snares within the range of the Riparian (San Joaquin Valley) woodrat, the traps or snares will incorporate an attached pan tensioning device to eliminate the capture of all smaller non-target animals such as the Riparian (San Joaquin Valley) woodrat. The proposed action does not include the use of rodenticides or small rodent traps.
The Riparian (San Joaquin Valley) woodrat is not susceptible to other APHIS-WS management tools. There is no opportunity for the Riparian (San Joaquin Valley) woodrat to be adversely exposed to APHIS-WS program activities. Any impact would likely be beneficial by removing known predators of the woodrat. Therefore, the proposed activities are **not likely to adversely affect the Riparian (San Joaquin Valley) woodrat.**

San Joaquin kit fox (*Vulpes macrotis mutica*)- (Federally Endangered 3/11/67) - APHIS-WS met with the FWS on Feb. 19, 1997 and discussed new information on the San Joaquin kit fox. FWS agreed to provide APHIS-WS with an updated map for the kit fox which includes recent sightings outside the 1990 map provided to APHIS-WS. The FWS indicated it was producing this map to be used solely by APHIS-WS personnel in the range of the kit fox and for the purpose of APHIS-WS predator damage management for the protection of livestock, property, and human health and safety. The updated map was to include areas where FWS feels the kit fox is likely to occur outside the previous map produced for APHIS-WS, in particular, grassland areas adjacent to the current map. APHIS-WS has recently received the updated map (attached) and adopts and incorporates the map for the purposes of this consultation.

The FWS 1992 BO on the APHIS-WS program provides for reasonable and prudent alternatives to preclude jeopardy during coyote and rodent control within recognized occupied range of the San Joaquin kit fox. Snares are not to be used within the recognized occupied range of the San Joaquin kit fox. However, the leg snares included under the proposed action at the time the BO was prepared did not include tension devices to exclude smaller animals. In the 1992 BO, the FWS provided for the use of leg-hold traps if they are equipped with permanently attached, built-in pan tensioning devices such that at least 4.5 pounds of pressure is required to spring the trap. Since that time, and since the passage of Proposition 4, the California APHIS-WS program has developed leg snares that have permanently attached built-in pan tension devices to exclude smaller non-target animals. APHIS-WS now proposes to use leg snares with permanently attached pan tension devices designed to exclude animals that place less than 4.5 pounds of pressure on the trigger. APHIS-WS has never captured a kit fox in a leghold trap that was equipped with a permanently attached pan tension device. The snare equipped with a built in pan tension device would pose no more risk to the kit fox than the leg hold trap with the tension device. Since use of the leg snare is consistent with the intent of the 1992 BO and the associated reasonable and prudent alternatives, we do not anticipate that any kit foxes would be taken as a result of the action. In addition, the use of these new pan tension equipped leg snares may increase the recovery potential of the kit fox by providing APHIS-WS a more effective, efficient, and safe means of controlling potential predators to kit fox and thereby supporting the expansion of kit fox populations into new habitats.

The proposed action does include the use of gas cartridges for coyotes. Endangered species considerations on the gas cartridge label limit its use within the occupied habitats of the San Joaquin kit fox, as determined by the U.S. Fish and Wildlife Service in Alameda, Contra Costa, Fresno, Kern, Kings, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Santa Clara, Stanislaus, or Tulare Counties, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens that meet an "observance standard" meaning coyotes must be positively observed (by sight or sound) by qualified personnel at the time of or immediately prior to treatment.

APHIS agrees to use the expanded range map (attached) derived by the Service as the best available current data for San Joaquin kit fox. APHIS-WS may pursue a refinement/amendment to this map, with USFWS concurrence, as new information is obtained. The attached map is not meant to be conclusive, but instead is meant to provide general guidance to APHIS as the Wildlife Services programs are implemented. The USFWS has agreed that more detailed maps including distinguishing topographic features such as rivers and roadways should be used by field personnel and can be obtained by contacting Daniel Russell, Section 7 Branch Chief, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825-1846, (916) 414-6636. Even these more detailed maps, however, can only serve as rough guidelines. The San Joaquin kit fox occurs on industrial lands, grasslands, ruderal lands, crop lands, schools grounds, prison grounds, oak woodlands, scrub lands, alkali sink habitat, and any other types of open ground between buildings and structures in the areas and near the areas identified on the map. Project-specific determinations will have to be made by APHIS personnel. If APHIS personnel are uncertain as to whether a project site is within the range of the kit fox, it is the Service's recommendation that APHIS (a) use extra caution by employing the above mentioned "observance standard" or (b) contact the Sacramento Fish and Wildlife Office for a site-specific determination.

Given these factors, APHIS-WS has concluded that the proposed action, as modified with the reasonable and prudent alternatives in the USFWS 1992 BO, with the addition of leg snares equipped with pan tension devices and denning cartridges, **is not likely to adversely affect the San Joaquin kit fox.**

Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) The Tipton kangaroo rat is restricted to a few remaining alkali sink areas of marginal habitat in the lower Central Valley. The proposed action does not include the use of rodenticides or small rodent traps. The proposed action does include the use of gas cartridges for coyote damage management. The use of gas cartridges within the occupied habitats of the Tipton kangaroo rat is limited, by its label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens where it is unlikely that rodents would be coexisting with coyotes. The USFWS has informed APHIS-WS that this species has a large auditory center in its brain and is thought to be highly sensitive to noise.

If a need arises to use leghold traps or leg snares within the range of the Tipton kangaroo rat, the traps or snares will incorporate an attached pan tension device to eliminate the capture of all smaller non-target animals such as the kangaroo rat. There is little opportunity for the Tipton kangaroo rat to be adversely exposed to APHIS-WS program activities. Impacts may be beneficial by removing known predators of the kangaroo rat. Therefore, the proposed activities are **not likely to adversely affect the Tipton kangaroo rat.**

Stephen's kangaroo rat (*Dipodomys stephensi (incl. D. cascus*). The Stephen's kangaroo rat is found in the San Jacinto Valley and nearby foothill grasslands in sparsely vegetated habitats. The proposed action does not include the use of rodenticides or small rodent traps. The proposed action does include the use of gas cartridges for coyote damage management. The use of gas cartridges within the occupied habitats of the Stephen's kangaroo rat is limited, by its label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens where it is unlikely that rodents would be coexisting with coyotes.

If a need arises to use leghold traps or leg snares within the range of the Stephen's kangaroo rat, the traps or snares will incorporate an attached pan tension device to eliminate the capture of all smaller non-target animals such as the kangaroo rat. There is little opportunity for the Stephen's kangaroo rat to be adversely exposed to APHIS-WS program activities. Impacts may be beneficial by removing known predators of the kangaroo rat. Therefore, the proposed activities are **not likely to adversely affect the Stephen's kangaroo rat.**

Riparian brush rabbit *(Sylvilagus bachmani riparius)* - (Federally Endangered 3/24/00). The riparian brush rabbit is restricted to the Caswell State Park in San Joaquin County and areas shown in the attached map from the USFWS. APHIS-WS does not currently conduct activities in the habitat of the riparian brush rabbit. APHIS-WS may use audio repellent devices (but not pyrotechnics) near riparian areas in the range of the species, but not in riparian areas. There is little opportunity for the riparian brush rabbit to be adversely exposed to APHIS-WS program activities therefore the proposed activities are **not likely to adversely affect the riparian brush rabbit.**

Buena Vista Lake shrew (*Sorex ornatus relictus*) - (Federally Endangered 3-6-02, Federally Proposed Endangered 6-1-00). The Buena Vista Lake shrew lives in the marshes of the southern San Joaquin Valley. It is a subspecies of the ornate shrew, S. ornatus. Historically, Buena Vista Lake shrews occurred in the wetlands around Buena Vista Lake, Kern County, and supposedly throughout the Tulare Lake Basin. Beginning in the 1930's before their distribution was adequately documented, the loss of lakes and sloughs due to changes in land uses and water diversions began to restrict the habitat. The proposed action does not include the use of rodenticides. APHIS-WS does not conduct activities within the habitat types utilized by the Buena Vista Lake shrew. There is no opportunity for the adverse exposure to APHIS-WS program activities. The proposed activities will have **no effect on the Buena Vista Lake shrew.**

The following conclusions based on prior consultation between APHIS-WS and the USFWS remain valid:

Fresno kangaroo rat (*Dipodomys nitratoides exilis)* - (Federally Endangered 3/1/85). The Fresno kangaroo rat is restricted to a few remaining alkali sink areas of marginal habitat in the lower Central Valley. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyotes. The use of gas cartridges within the occupied habitats of the Fresno kangaroo rat is limited, by the label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens. If a need arises to use leghold traps or leg snares within the range of the Fresno kangaroo rat the traps or snares will incorporate a pan tension device to eliminate the capture of smaller non-target animals such as the Fresno kangaroo rat. The USFWS has informed APHIS-WS that this species has a large auditory center in its brain and is thought to be highly sensitive to noise. There is little opportunity for adverse exposure from the proposed actions. Any impacts would likely be beneficial by removing known predators of the kangaroo rat. The proposed activities are **not likely to adversely affect the Fresno kangaroo rat.**

Giant kangaroo rat *(Dipodomys ingens)* - (Federally Endangered 1/5/87). The giant kangaroo rat is a rare, permanent resident in scattered colonies along the western side of the San Joaquin Valley (e.g., Carrizo Plain, Panoche Valley). The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyotes. The use of gas cartridges within the occupied habitats of the giant kangaroo rat is limited, by its label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens. If a need arises to use leghold traps or leg snares within the range of the giant kangaroo rat the traps or snares will incorporate a pan tension device to eliminate the capture of smaller non-target animals such as the giant kangaroo rat. The USFWS has informed APHIS-WS that this species has a large auditory center in its brain and is thought to be highly sensitive to noise. There is little opportunity for any adverse exposure to any APHIS-WS methods. Any impacts would likely be beneficial by removing known predators of the kangaroo rat. The proposed activities are **not likely to adversely affect the giant kangaroo rat.**

Morro Bay kangaroo rat *(Dipodomys heermanni morroensis)* - (Federally Endangered 10/13/70). The Morro Bay kangaroo rat occurs near Morro in San Luis Obispo County. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Endangered species considerations on the gas cartridge label exclude the use of the gas cartridge within the occupied habitats of the

Morro Bay kangaroo rat and APHIS-WS abides by those label restrictions. If the need arises to use leghold traps or leg snares within the range of the Morro Bay kangaroo rat, the traps or snares will incorporate a pan tension device to eliminate the capture of smaller animals such as the Morro Bay kangaroo rat. There is little opportunity for the Morro Bay kangaroo rat to be adversely exposed to APHIS-WS program activities. Any impact would likely be beneficial by reducing predation. The proposed activities are **not likely to adversely affect the Morro Bay kanagaroo rat.**

Pacific pocket mouse (Perognathus longimembris pacificus) - (Federally Endangered 9/26/94). The Pacific pocket mouse is endemic to the immediate coast of southern California. There are currently four known populations: one within Orange County and three occurring on Marine Corps Base, Camp Pendleton in San Diego County. Suitable habitat includes fine-grain, sandy or gravelly substrates in the immediate vicinity of the Pacific Ocean. It is not susceptible to any of the proposed APHIS-WS control tools. The pocket mouse lives in burrows which it plugs during the day. The proposed action does not include the use of any rodenticides or small rodent traps. There is little opportunity for the Pacific pocket mouse to be adversely exposed to any APHIS-WS program activities. Impacts may be beneficial by removing known predators of the Pacific pocket mouse. The proposed activities are **not likely to adversely affect the Pacific pocket mouse.**

AMPHIBIANS

Arroyo (arroyo southwestern) toad *(Bufo microscaphus californicus)* - (Federally Endangered 1/17/95). The arroyo toad is restricted to rivers that have shallow, gravelly pools adjacent to sandy terraces. The arroyo toad is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the arroyo toad. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which do not normally harbor toads coexisting with coyotes. Therefore, the proposed activities will have **no effect on the arroyo toad.**

California red-legged frog *(Rana aurora draytoni)* - (Federally Threatened 5/20/96). The California red-legged frog inhabits quiet pools of streams, marshes, and occasionally ponds. It prefers shorelines with extensive vegetation. The red-legged frog is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the California red-legged frog. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which 1) do not normally occur in wet/moist areas associated with the red-legged frog and 2) do not normally harbor frogs coexisting with coyotes. The USFWS has issued a Biological Opinion (March 13, 2000) for the Habitat Improvement Project for the California Red-legged Frog at Camp San Luis Obispo, California (1-8-99-F-86), to the California Army National Guard. Work performed by APHIS-WS to protect the California red-legged frog is addressed in the BO, and is being assessed in Part I of this BA. APHIS-WS has also initiated a formal consultation which further addresses the project at Camp San Luis Obispo (9/9/03). The USFWS has indicated that it feels the proposed project described in this informal consultation is **not likely to adversely affect the California red-legged frog.**

California tiger salamander *(Ambystoma californiense)* - (Federally Endangered 9/15/00). The California tiger salamander's range includes the Central Valley from Yolo County south to Kern County, and coastal grasslands from the vicinity of San Francisco Bay south at least to Santa Barbara County. The salamander is not susceptible to any APHIS-WS tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the California tiger salamander. Gas cartridges are used only in active coyote dens which do not normally harbor salamanders coexisting with coyotes. APHIS-WS will apply the "observance standards" for active coyote dens to this species. The proposed action does not include the use of rodenticides. There is little opportunity for the California tiger salamander to be adversely affected by APHIS-WS program activities. The proposed action will have **no effect on the California tiger salamander.**

Desert slender salamander *(Batrachoseps aridus)* - (Federally Endangered 6/4/73). The desert slender salamander is found only in Hidden Palm Canyon, a tributary of Deep Canyon, Riverside County. The desert slender salamander is not susceptible to any of APHIS-WS's control tools. Leghold traps incorporate pan tension devices which preclude the capture of smaller non-target animals such as the California slender salamander. Gas cartridges are used only in active coyote dens which do not normally harbor salamanders coexisting with coyotes. The proposed action does not include the use of rodenticides. There is little opportunity for the desert slender salamander to be adversely exposed to any APHIS-WS program activities. The proposed action **will have no effect on the desert slender salamander.**

Mountain yellow-legged frog - *So. Calif. Pop. (Rana muscosa)* - (Federally Proposed Endangered 12-28-99). The yellow-legged frog is associated with montane streams, lakes, and ponds. It prefers montane riparian areas and can also be found in lodgepole pine, subalpine conifer and wet meadow habitats. The yellow-legged frog is not susceptible to most APHIS-WS management tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the Mountain yellow-legged frog. The proposed action does not include the use of rodenticides. The proposed action does include the use of gas cartridges for coyote damage management. Gas cartridges are used only in active coyote dens which 1) do not normally occur in wet/moist areas associated with the mountain yellow-legged frog, and 2) do not normally harbor frogs coexisting with coyotes. APHIS-WS will have **no effect on the mountain yellow legged frog.**

Santa Cruz long-toed salamander *(Ambystoma macrodactylum croceum)* - (Federally Endangered 3/11/67). The Santa Cruz long-toed salamander is not susceptible to any of APHIS-WS's control tools. Leghold traps and leg snares incorporate pan tension devices which preclude the capture of smaller non-target animals such as the Santa Cruz long-toed salamander. Gas cartridges are used only in active coyote dens which do not normally harbor salamanders coexisting with coyotes. APHIS-WS will apply the "observance standards" for active coyote dens to this species. The proposed action does not include the use of rodenticides. There is little opportunity for exposure. The proposed action will have **no effect on the Santa Cruz long-toed salamander.**

REPTILES

Alameda whipsnake (= striped racer) *(Masticophis lateralis euryxanthus)* - (Federally Threatened 12/5/97). The Alameda whipsnake occurs in northern coastal scrub, chaparral, and adjacent habitats in the inner coast ranges of the western and central Coast Ranges from just north of San Francisco Bay to the vicinity of Monterey. It prefers mixed chaparral, chamise-redshank chaparral, and valley-foothill hardwood and hardwood-conifer as well as various coniferous habitats. The proposed action does not include the use of rodenticides. There is little opportunity for exposure. The proposed activities are **not likely to adversely affect the Alameda whipsnake.**

Blunt-nosed leopard lizard *(Gambelia silus)* - (Federally Threatened 3/11/67). The blunt-nosed leopard lizard is a scarce resident of sparsely vegetated alkali and desert scrub habitats. It occurs at scattered sites in the San Joaquin Valley. The FWS 1992 BO anticipated that one lizard may be taken by underground control methods and determined that this level of impact is not likely to result in jeopardy to the species. The FWS provided reasonable and prudent measures that were necessary and appropriate at the time of the BO to minimize incidental take of the blunt-nosed leopard lizard:

1. Continue to restrict use of fumigants within the range of the blunt-nosed leopard lizard.

The terms and conditions which implemented the reasonable and prudent measure are:

1. Existing label restrictions prohibiting use of gas cartridges manufactured and distributed by (APHIS-WS) personnel within the range of the San Joaquin kit fox and blunt-nosed leopard lizard shall be continued and adhered to. Fumigants used by (APHIS-WS) personnel for predator control shall not be used within the range of the blunt-nosed leopard lizard.

2. No rodent control method or agent not discussed or restricted above shall be used within areas likely to be inhabited by blunt-nosed leopard lizards unless further consultation with the Service is conduced and the FWS concurrence in any proposed activities is obtained.

3. If one dead or sublethally affected specimen is discovered, use of that pesticide must cease and consultation on that chemical for that species must be reinitiated. Any incidental take shall be reported immediately to the Sacramento Field Office.

APHIS-WS has never taken a blunt-nosed leopard lizard. There are no rodent control methods or agents proposed for this project. Existing label endangered species considerations now specify that the gas cartridge not be used within the occupied habitat of the blunt-nosed leopard lizard in Fresno, Kern, Kings, Merced, Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Clara, and Stanislaus Counties from October 1 to April 15 unless a specific blunt-nosed leopard lizard protection program for this period is approved by the USFWS and fully implemented. Use of this product in occupied habitat of this species from April 15 through September 30 is limited to daylight hours when air temperatures are 77 - 95 degrees F. APHIS-WS follows all label restrictions. APHIS-WS has received an expanded range map provided by the USFWS (attached) and agrees to use the map for restriction to protect this species.

Because of their size, blunt-nosed leopard lizards are not susceptible to traps or snares with pan tension devices.

APHIS-WS has determined that the proposed activities **are not likely to adversely affect the blunt-nosed leopard lizard.**

Coachella Valley fringe-toed lizard *(Uma inornata)* - (Federally Threatened 9/25/80). The Coachella Valley fringe-toed lizard is uncommon and limited in range to sand dunes in the Coachella Valley, Riverside County.   The proposed action does not include the use of rodenticides. In following endangered species considerations on its label, the gas cartridge will not be used within occupied habitats of the Coachella Valley fringe-toed lizard in the Coachella Valley area of Southern California. The lizard is not susceptible to any of APHIS-WS's other control tools. Therefore, there is no opportunity for the lizard to be adversely exposed to APHIS-WS program activities and the proposed activities will have **no effect on the Coachella Valley fringe-toed lizard.**

Desert Tortoise The desert tortoise is being addressed in the national APHIS-WS programmatic consultation. The California APHIS-WS program will adopt the findings from the national consultation for desert tortoise considerations.

Giant garter snake (*Thamnophis couchi gigas*) - (Federally Threatened 10/20/93). The giant garter snake is found on the floor of the Central Valley from Sacramento and Antioch south to Bueno Vista Lake, Kern County. Because of the way snakes distribute their weight and because the snake is not attracted to predator baits, the giant garter snake is not susceptible to leghold traps or leg snares with pan tension devices. The proposed action does not include the use of rodenticides.

APHIS will apply the same "observation standard" (sight or auditory detection at active coyote dens described above under kit fox effects) within the range of these species when using gas cartridges. This concurrence is also conditional on the following (previously used as a term and condition of the 1992 Biological Opinion for use of fumigants on the San Francisco garter snake): "Discovery of one dead or sublethally taken garter snake caused by any of the chemicals requires immediate cessation of its use and reinitiation of consultation on that chemical for the garter snake(s)." The USFWS stated that these avoidance measures must also be applied in Glen, Butte, Colusa, Yuba, Sutter, Yolo, Placer, and Sacramento Counties in addition to those noted above.

There is little opportunity for the giant garter snake to be adversely exposed to any APHIS-WS program activities. The proposed activities are **not likely to adversely affect the giant garter snake.**

Island night lizard *(Xantusia riversiana)* - (Federally Threatened 8/11/67). The island night lizard occurs on the Channel Islands off the coast of southern California. APHIS-WS does not currently conduct wildlife damage management on the islands. The use of the gas cartridge within the occupied habitat of the island night lizard is prohibited by the label. The night lizard is not susceptible to any other APHIS-WS control tool. There is no opportunity for the island night lizard to be adversely exposed to APHIS-WS program activities. The proposed activities will have **no effect on the island night lizard.**

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) - (Federally Endangered 3/11/67). The 1992 FWS BO on the APHIS-WS program provides for the following reasonable and prudent measure:

Fumigant use should be strictly controlled within the known range of the garter snake. APHIS will apply the same "observation standard" (sight or auditory detection at active coyote dens described above under kit fox effects) within the range of this species when using gas cartridges.

In order to be exempt from the prohibitions of Section 9 of the Act, WS must comply with the following terms and conditions, which implement the reasonable and prudent measures.

1. Aluminum phosphide, gas cartridges, and other fumigants shall not be used in San Mateo County, California, unless proposals for use are first reviewed and approved by the Fish and Wildlife Service, Office of Fish and Wildlife Enhancement, Sacramento, California.

2. Discovery of one dead or sublethally taken garter snake caused by any of the chemicals requires immediate cessation of its use and reinitiation of consultation on that chemical for the garter snake.

Endangered species considerations on the large gas cartridge label now require that the product not be used in San Mateo, San Francisco, Santa Clara, and Santa Cruz Counties, California, from November 1 to March 30 unless a specific San Francisco garter snake protection program for this period is approved by the U.S. Fish and Wildlife Service and fully implemented. Use of the gas cartridge in occupied habitat of the garter snake under such approved programs or from April 1 through October 31 is limited to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. Because gas cartridges are used according to label restrictions and only in active coyote dens, and because other fumigants are not proposed, APHIS-WS has determined that the proposed action **is not likely to adversely affect the San Francisco garter snake.**

Finally, the Ventura Field office of the USFWS has indicated that APHIS-WS add the following species to the MAY AFFECT list for the National programmatic consultation. For your information, we have determined that the proposed action will have **no effect** on the following species for these reasons:

Tidewater goby (*Eucyclogobius newberryi*) and u**narmored threespine stickleback** (*Gasterosteus aculeatus williamsoni*). The California APHIS-WS program does not use the methods of concern to the Service: explosives to remove beaver dams, bird netting to protect fish populations, or water-surface chemical applications. The USFWS has indicated that further consultation would be required if these species are found within the action area.

Fairy shrimp species. APHIS-WS does not use alpha-chlorolose near vernal pools in California.

Amargosa vole (*Microtus californicus scirpensis*). The Amargosa vole is known only from seven bulrush marshes along the Amargosa River in southeastern Inyo County. This proposed action does not include the use of rodenticides. APHIS-WS does not conduct activities within the habitat types utilized by the Amargosa vole. There is no opportunity for the Amargosa vole to be adversely exposed to APHIS-WS program activities. The USFWS has indicated that further consultation would be required if this species were found within the project area.

Inyo California towhee (former taxonomic status included under *P. fuscus* - Inyo brown towhee) (*Pipilo crissalis eremophilus*). It has a small range in the Argus Mountains, in Inyo County, California. Because of the behavior of the Inyo brown towhee and its small size, it is not susceptible to any of APHIS-WS's proposed management tools in California. APHIS-WS does not use the bird control methods of concern to the Service in Inyo County. There is no opportunity for the Inyo brown towhee to be adversely exposed to APHIS-WS program activities. However, the USFWS has indicated that further consultation should be required if the species were found within the action area.

SUMMARY OF POTENTIAL IMPACTS OF MANAGEMENT METHODS

The following conclusions led to our final determination of the effects that implementation of the proposed APHIS-WS activities in California would have on Threatened and Endangered species, and on species proposed for listing:

1. Leghold traps do not pose a threat to T&E species in California if they are used with pan tension devices and if set at least 30 feet from an exposed bait station.

2. Cage traps do not pose a threat to T&E species when they are used in urban areas or are large enough to allow small T&E species to escape. Cage traps are checked daily which would allow for the release of any non-target animals. Cage traps are routinely used by APHIS-WS to capture skunks, raccoons, and opossums. Cage traps are also used to capture mountain lions and black bears in urban and rural areas. These large cage traps do not pose a treat to T&E species as small species will not spring the trap.

3. Neck snares will not be used in range of the San Joaquin kit fox. Neck snares do not pose a threat to T&E species in California when properly set for target species and when set 30 feet or more from exposed bait.

4. Leg snares do not pose a threat to T&E species in California if they are used with pan tension devices.

5. Dogs do not pose a threat to T&E species when properly trained to trail only target animals. APHIS-WS use highly trained and very disciplined dogs. Dogs will not be utilized to track predators responsible for livestock and/or property damage through critical habitat of the southwestern willow flycatcher during the breeding season (May through September).

6. Alpha-chloralose does not pose a threat to T&E species as it is delivered specifically to the target animals and the target animals are removed from the field once they are under the influence of the drug.

7. Shooting does not pose a risk to T&E species when conducted by professional APHIS-WS Specialists.

8. Conibear traps do not pose a threat to T&E species except the Point Arena mountain beaver. In Point Arena mountain beaver range conibears would be set only under water thus mitigating any threat caused by the conibear traps. No above water sets will be used within the range of the San Joaquin kit fox.

9. Aerial hunting with steel shot does not pose a threat to T&E species when conducted by APHIS-WS professionals. Lead shot is not used in any aerial hunting operations.

10. M-44 Cyanide Capsules do not pose a threat to T&E species present in California when set at least 30 feet from a draw station, except to the San Joaquin kit fox. M-44s are currently not authorized for use in California except on Tribal lands. On Tribal lands, or elsewhere, should APHIS-WS receive reauthorization to use M-44s, they would not be used to control predator species within the recognized occupied range of the San Joaquin kit fox.

11. DRC-1339 is not likely to adversely affect any T&E species in California because of its specificity to target pest birds and its low potential for secondary toxicity. DRC 1339 is a slow acting avian toxicant that is rapidly metabolized to a nontoxic metabolite and excreted after ingestion. Because of the rapid metabolism of DRC-1339 it poses little secondary risk to non-target animals, including avian scavengers. This compound is also unique because of its relatively high toxicity to most pest birds but low-to-moderate toxicity to most raptors and almost no toxicity to mammals. The chance of adverse effects is further reduced by following the label directions. Prebaiting must be conducted to identify if any threatened or endangered species are in the area. All unconsumed bait material is disposed of in accordance with applicable state and federal laws. If any T&E species appear during baiting hazing tactics will be used to frighten them from the site or the operation will be suspended and the bait will be removed from the field. Carcasses of dead and/or dying target birds are disposed of by burning or burial as authorized by applicable laws.

12. Compound 1080 Livestock Protection Collars (LPC) are currently not authorized for use in California. Compound 1080 would not be used on Tribal lands. Should APHIS-WS receive

authorization, APHIS-WS would reinitiate consultation with the USFWS.

13. The gas cartridge used for coyote damage management is not likely to adversely affect the Fresno kangaroo rat, giant kangaroo rat, Stephen's kangaroo rat, Tipton kangaroo rat, Point Arena mountain beaver and San Joaquin kit fox, California tiger salamander and Santa Cruz long-toed salamander when used by professional APHIS-WS Specialists trained to identify target coyote dens from non-target dens and burrows and when updated range maps and observance standards discussed under specific species are applied.

The San Bernardino Merriam's kangaroo rat is not listed on the Endangered Species Considerations insert for the large gas cartridge. Much of the range of the San Bernardino Merriam's kangaroo rat overlaps with the Stephen's kangaroo rat. The use of the gas cartridges within the occupied habitats of the Stevens kangaroo rat is limited, by its label, to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. In addition, APHIS-WS will limit the use of the gas cartridge within all occupied habitat of the San Bernardino Merriam's kangaroo rat to qualified individuals who have been trained to distinguish dens and burrows of target species from those of non-target species. The cartridges will be used only in active coyote dens where it is unlikely that rodents would be coexisting with coyotes. Therefore, use of the gas cartridge is not likely to adversely affect the San Bernardino Merriam's kangaroo rat.

Gas cartridges used for coyote damage management are not likely to adversely affect the blunt-nosed leopard lizard or San Francisco garter snake when used according to label restrictions which provide for seasonal restrictions and protection plans approved by the USFWS .

Gas cartridges used for coyote damage management will have no effect on the Morro Bay kangaroo rat, the Coachella Valley fringe-toed lizard, and the Island night lizard because the product may not be used within the occupied habitats of these species.

The gas cartridge is used only at active coyote den sites and per all label restrictions. This proposal does not include the use of rodent gas cartridges.

14. Sodium pentobarbital does not pose a threat to T&E species as it is delivered directly to the target animal through injection and the carcass is disposed of properly.

15. CO_2 does not pose a threat to T&E species as it is delivered directly to the target animal in an enclosed system/container and the carcass is disposed of properly.

16. Vehicle use will not pose a threat to T&E species because it is extremely limited by the small number of APHIS-WS personnel and by the ethical conduct of APHIS-WS Specialists. It is not prudent or ethical to travel off existing roadways or trails on private property except where it is absolutely necessary.

17. Audio and visual repellants will not pose a threat to T&E species since they are normally placed in croplands to protect crops from migratory waterfowl or are placed close to human

habitation.

18. APHIS-WS predator damage management activities are not likely to adversely affect any T&E species by increasing meso-predator populations. APHIS-WS targets offending predators and does not significantly reduce overall predator populations.

APPENDIX A

Key APHIS-WS Directives

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive 2.105 03/01/04

THE WS INTEGRATED WILDLIFE DAMAGE MANAGEMENT PROGRAM

1. PURPOSE
   To summarize the Integrated Wildlife Damage Management (IWDM) concept used by USDA/APHIS/WS.

2. REPLACEMENT HIGHLIGHTS
   This directive replaces WS Directive 2.105 dated 06/14/98.

3. BACKGROUND
   The WS program applies the IWDM (commonly known as Integrated Pest Management) approach to reduce wildlife damage. As used and recommended by the WS program, IWDM encompasses the integration and application of all approved methods of prevention and management to reduce wildlife damage. The IWDM approach may incorporate cultural practices, habitat modification, animal behavior management, local population reduction, or a combination of these approaches. The selection of wildlife damage management methods and their application must consider the species causing the damage and the magnitude, geographic extent, duration, frequency, and likelihood of recurring damage. In addition, consideration is given to non-target species, environmental conditions and impacts, social and legal factors, and relative costs of management options.

4. POLICY
   WS personnel shall apply and use the IWDM approach to efficiently and effectively prevent or reduce damage caused by wildlife. In applying IWDM to wildlife damage management, the WS program may offer technical assistance, direct control, or a combination of both in response to requests for help with wildlife damage problems.

Deputy Administrator

Distribution: **Originating Office:**

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.210 03/01/04

COMPLIANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS

1. PURPOSE

To ensure that WS employees are in compliance with all applicable Federal, State, and local laws and regulations.

2. REPLACEMENT HIGHLIGHTS

This directive replaces WS Directive 2.210 dated 07/14/98.

3. POLICY

All employees (Federal and non-Federal) are responsible for conducting official duties in compliance with Federal, State, and local laws and regulations. In a situation requiring variance, written authorization must be obtained from the appropriate authority.

Supervisors shall ensure that all employees are aware of pertinent laws and regulations.

Deputy Administrator

WS Directive 2.310 07/28/03

ENDANGERED AND THREATENED SPECIES

1. PURPOSE
   To establish guidelines for WS activities associated with federally listed endangered and threatened species.

2. REPLACEMENT HIGHLIGHTS
   This directive replaces ADC Directive 2.310 dated 3/26/93.

3. POLICY
   WS will conduct its activities to minimize impact on any federally listed endangered or threatened species or adversely modifying listed critical habitat.

   The Director of the WS Operational Support Staff is responsible for notifying WS State Directors of any new or proposed Federal listings of endangered or threatened species. State Directors are responsible for knowing all federally proposed and listed endangered and threatened species and designated critical habitats that occur in their area of responsibility, and for conducting their program activities in a manner consistent with this policy.

   WS State Directors will assure that all of their WS employees (Federal and non-Federal) are familiar with the requirements of Section 7 of the Endangered Species Act, as amended. WS employees will also be familiar with Section 7 biological opinions on listed species potentially impacted by their wildlife damage management activities. WS State Directors will initiate consultation with the U.S. Fish and Wildlife Service (FWS) if new damage management programs, new methods, or newly listed species result in the potential for adverse impacts.

   During routine work activities, incidents involving impacts on listed species will be reported by WS field personnel within 24 hours to the appropriate WS supervisor.

Distribution: **Originating Office:**

Unless otherwise authorized, the location of dead or seriously injured listed species will be immediately reported to the appropriate FWS Law Enforcement Office and State wildlife representative.

When endangered species are responsible for causing damage, the WS State Director will work with the FWS to determine if acceptable solutions for controlling damage can be agreed upon and implemented.

When a managing agency (Federal, state, tribal) requests WS assistance in protecting listed species or controlling damages caused by listed species, the requesting agency will bear responsibility for funding the work. The WS State Director will coordinate with appropriate Federal, state, and local agencies to arrange funding and determine acceptable control procedures.

4. REFERENCES

50 CFR Part 17 - Endangered and Threatened Wildlife and Plants
50 CFR Part 402 – Interagency Cooperation
Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended

Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.401 02/17/04

PESTICIDE USE

1. PURPOSE

To provide guidelines for storage, disposal, recordkeeping requirements, and the safe and effective use of pesticides in the WS program.

2. REPLACEMENT HIGHLIGHTS

This directive replaces WS Directive 2.401 dated 3/26/93.

3. POLICY

WS activities must be in compliance with all Federal, State, and local laws and regulations pertaining to pesticide applications, including certification requirements before using, transporting, shipping, disposing, supervising, or recommending the use of restricted use pesticides. Pesticides used or recommended by WS personnel must be registered by the U.S. Environmental Protection Agency (EPA) and the appropriate State regulatory agency.

WS personnel have responsibility for all aspects of control operations involving WS restricted use pesticides having label language which specifies "for use only by USDA personnel... or persons under their direct supervision." While non-WS persons may be involved in various phases of operations using these pesticides, the actual application will be conducted only by WS certified applicators. Furthermore, pesticides displaying WS restriction-specific labels, and all derived chemical products, will not be transferred or otherwise released to non-WS personnel. This restriction does not preclude or limit reimbursement to WS for any cost of materials or services provided by WS involving these pesticides.

Pesticide use, storage, and disposal will conform to label instructions and other applicable regulations and laws. Before using any pesticide, WS personnel will be trained in its proper and safe use.

WS personnel will not conduct operational activities on private property where other persons are known to be using the same or a similar pesticide(s) intended for control of the same target

species. WS equipment, materials, and warning signs will be promptly removed from the area if such use is discovered.
WS will notify the property owner or manager of this action.

Material Safety Data Sheets (MSDS) and labels for each pesticide used by WS must be provided to all WS personnel and other potential users.

Pesticides must be stored in a locked or secured box, building, or vehicle when not in use. Warning signs or symbols required by Federal, State, and local laws and regulations must be displayed in the appropriate locations. Pesticides must be used in accordance with the Wildlife Services Standards for Storing Pesticides (See Attachment 1).

All unusable pesticides and by-products will be handled in a manner prescribed by the State Director (SD) and in accordance with EPA procedures. SD's are responsible for establishing proper accounting, monitoring, and recordkeeping procedures for all pesticides used in their program.

4. RECORDKEEPING REQUIREMENTS

Minimum recordkeeping for federally registered restricted use pesticides require that the following information must be recorded within 30 days following the pesticide application and be kept on file for at least 2 years [Note: State pesticide regulatory agencies may require additional recordkeeping and enforce longer retention dates]:

a. The brand or product name, and the EPA registration number of the restricted use pesticide that was applied;

b. The total amount of the restricted use pesticide applied;

c. The location of the application, the size of the area treated, and the crop, commodity, stored product, or site to which a restricted use pesticide was applied;

d. The month, day, and year when the restricted use pesticide application occurred; and,

e. The name and certification number of the certified applicator who applied or who supervised the application of the restricted use pesticide.

An inventory record will be maintained for pesticides utilizing the Control Materials Inventory Tracking System (CMITS). Records will be evaluated by Headquarters staff and with periodic spot checks by a designated official.

Any toxic or adverse human effect which occurs to WS personnel, cooperators, or public involving the use, storage, or disposal of any pesticide registered by USDA, APHIS is to be immediately reported to the SD and Director. The Director will report the incident and submit specifics to the Director of Environmental Services, APHIS, as appropriate. An adverse human effect is defined by EPA as an incident in which a person suffers an adverse physiological or behavioral effect (other than local damage to or irritation of the skin or eye of the type commonly associated with dermal or ocular exposure when the label provides adequate notice of such a hazard).

Additionally, WS personnel are required to report any knowledge of adverse incidents involving APHIS registered products. An adverse incident has occurred if a person or non-target organism is exposed to and/or has an adverse effect from a pesticide.

5. REFERENCES

Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), as amended

Food, Agriculture, Conservation, and Trade Act of 1990 (FACT Act)

National Environmental Policy Act (Public Law 91-190, 42 U.S.C 4321 et seq.)

40 CFR Part 153.75 - Toxic or Adverse Effect Incident Reports, (a)(1)(i) through (iii)

Federal Register Vol. 58, No. 67 p. 19014

Deputy Administrator

WS Directive 2.430 06/07/04

CHEMICAL IMMOBILIZATION AND EUTHANIZING AGENTS

1. PURPOSE
   To establish guidelines and training standards for Wildlife Services (WS) employees who administer immobilization and euthanasia (I&E) agents in a proper and professional manner and in compliance with all applicable laws and regulations.

2. REPLACEMENT HIGHLIGHTS
   This directive revises ADC Directive 2.430 dated 3/26/93.

3. BACKGROUND
   Most of the substances used to I&E wild animals are regulated by State and Federal law because of their potential to contaminate human food or to be used illegally. Within WS, only personnel trained and certified in their appropriate use are authorized to possess and use WS approved I&E substances.

   The Food and Drug Administration (FDA), which is primarily concerned with drugs and drug residues in food, regulates some drugs under authority of the Federal Food, Drug, and Cosmetic Act and the Animal Medicinal Drug Use Clarification Act (AMDUCA). The Drug Enforcement Administration (DEA), which is responsible for preventing illegal diversion of dangerous and addictive drugs, regulates drug storage and use in accordance with the Controlled Substance Act of 1970. DEA also establishes categories for sensitive drugs, i.e., schedules, which outline procedures for drug procurement, storage and use.

   WS approved I&E methods place the utmost emphasis on the humane treatment and welfare of both wildlife and humans. WS approved I&E methods take into consideration the principles established in the Report of the American Veterinary Medical Association Panel on Euthanasia.

The WS Deputy Administrator has established the I&E Committee to review and approve immobilization, euthanasia, and accessory agents, and 2) establish training requirements for WS as described in Chapter 2 of the WS Field Operations Manual for the Use of Immobilization and Euthanasia Drugs.

4. POLICY

WS operations personnel using I&E agents must receive training approved by the I&E Committee prior to independent use or possession of I&E substances (Attachment 1). Only agents approved by the I&E Committee can be used by the WS program, unless under emergency situations (Attachment 2). WS operations personnel needing to regularly use I&E agents other than those listed should submit a request to the Chair of the I&E Committee for WS approval. In emergency situations, unapproved drugs can be used on a one-time or limited basis by operations personnel when approved by an attending/consulting veterinarian and the State Director or designee, provided that such use is in compliance with all applicable laws.

NWRC personnel using I&E agents must receive training approved by the I&E Committee prior to independent use or possession of I&E substances, unless otherwise noted (Attachment 1). NWRC personnel must use agents for I&E in accordance with protocols approved by the Institutional Animal Care and Use Committee (IACUC). If not otherwise specified, only agents approved by the I&E Committee may be used (Attachment 2). Official activities of Attending or Consulting Veterinarians and those working under the specific instructions of these individuals are excluded from the provisions of this policy.

All acquisition, storage, and use of I&E agents will be in compliance with applicable Federal, State, and local laws and regulations.

5. RESPONSIBILITY

The Regional Directors and the NWRC Director, as well as the appropriate State Director, will ensure that all personnel using I&E agents receive adequate training in accordance with the guidelines presented in the WS I&E Manual. State Directors are responsible for WS use of I&E agents within their area of responsibility. Additional training requirements will be identified and provided by State Directors and NWRC Program Managers. Proper care and use and chain of custody and security of I&E agents in all locations and circumstances are the responsibility of all WS employees who are trained and certified in their use.

6. REFERENCES

Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301-392), as amended Controlled Substances Act (21 U.S.C. 801)

21 CFR

Part 511 - New Animal Drugs for Investigational Use

Section 511.1 - New animal drugs for investigational use exempt from section 412(a) of the Act

Part 514 - New Animal Drug Applications

Section 514.1(b)8 - Evidence to establish safety and effectiveness

Part 1301 - Registration of Manufacturers, Distributors, and Dispensers of Controlled Substances

Section 1301.21 - Persons required to register Section 1301.22 - Separate registration for independent activities

Section 1301.90 - Employee screening procedures

Part 1308 - Schedules of Controlled Substances Section 1308.03 - Administration Controlled Substances Code Number

Sections 1308.11 - 1308.15 Schedules I-V

Animal Medicinal Drug Use Clarification Act, 1996

American Veterinary Medical Association. 2001. 2000 Report of the AVMA Panel on Euthanasia. JAVMA 218(5):669-696.

Wildlife Services. 2001. Field Operations Manual for the Use of Immobilization and Euthanasia Drugs. Dr. Mark Johnson, DVM, and I/E Committee, USDA/APHIS/WS, Riverdale, MD. 120 pp.

Deputy Administrator

2 Attachments

Attachment 1

WS IMMOBILIZATION & EUTHANASIA TRAINING REQUIREMENTS

The WS I&E training and certification program is provided for personnel under direct supervision of the WS program directors who administer I&E drugs. Training guidelines have been established to ensure that WS personnel receive adequate training to administer agents used for immobilization and euthanasia in a professional and proper manner and in compliance with all applicable laws and regulations.

I. Initial Certification Requirements

For new employees, current employees who have not been previously certified, or current employees whose certifications have expired:

1. Satisfactory completion of a 24 hour, approved I&E training course. The WS Field Operations Manual for the Use of Immobilization and Euthanasia Drugs must be used as the training document. The training consists of:

   a. 16 hours classroom. Veterinary medical portions of the training must be taught by a veterinarian. Qualified WS personnel may assist the veterinarian in teaching non-medical topics

   b. 8 hours hands-on/lab training. A veterinarian must supervise the instruction.

   c. Receive a passing grade on the WS I&E Test (70%). The WS I&E Test will be a proctored exam.

2. Completion of the WS I&E Distance Learning Module (DLM) with a passing grade can serve for the classroom portion of training. The same hands-on/lab training and testing as described above is required.

3. Documentation (certificate, letter, DLM grade record) of training for each employee must be provided to the Chair of the I&E committee as proof of training.

II. Continuing Education Requirements

WS I&E Certification is valid for 5 years from the date on the training document. To maintain I&E certification, certified employees must:

1. Complete 20 hours of continuing education within the 5 year

period. A minimum of 4 of the 20 hours must cover I & E drugs. The remaining 16 hours may include: laws, recordkeeping, safety, first aid/CPR, I & E equipment and supplies, animal handling, wildlife disease, or other topic approved by the committee.

2. Re-take the WS I&E test and receive a passing grade (70%).

3. Documentation (certificate, letter, DLM grade record, proctored WS I&E test grade) of training for each employee must be provided to the Chair of the I&E committee as proof of continuing education training.

III. Interim Training

If there is a critical need (as determined by the State Director) for a WS employee to use I&E drugs as part of their job responsibility before formal I&E training can be provided, a qualified (certified and experienced) WS employee may train the new employee in the appropriate procedures. A written description of the training signed by the WS trainer will be provided to the Chair of the I&E Committee as proof of training. The interim certification will automatically expire at the end of 1 year. Seasonal employees may not substitute interim training for certification training.

Attachment 2

WS APPROVED IMMOBILIZATION&EUTHANASIA AGENTS*

The list below contains I&E agents/drugs that are approved by the I&E

Committee for WS use. Agents or drugs not listed must be approved by the I&E Committee prior to use. Depending on the situation, listed drugs may be used independently or in combination.

Scheduled drugs are regulated by the DEA. All drugs used on or in animals, even if not scheduled, must be approved for use by the FDA. Both FDA and DEA set standards for accountability and storage.

The following agents are approved for use by WS personnel.

a. <u>Anesthetics</u>

(1) Ketamine HCL: e.g., Ketaset®, Vetalar®

(2) Tiletamine HCL + Zolazapam: i.e., Telazol®*

(3) Acepromazine

(4) Alpha-chloralose (INAD)

(5) Propriopromazine (INAD): e.g., TTD

b. <u>Sedative</u>

(1) Xylazine: e.g., Rompun®, Cervizine™, AnaSed®

c. <u>Accessory Drugs</u>

(1) Yohimbine HCL

(2) Tolazoline

(3) Antibiotics: e.g., Crystiben®, Crystacillin®, Dual-Pen®; oxytetracycline LA-200®, Oxyject®, Liquamycin®.

(4) Atropine

(5) Doxapram: e.g., Dopram-V®, Dopram®.

d. <u>Euthanasia Agents</u>

(1) Sodium Pentobarbital*: e.g., Beuthanasia®-D Special, FP-3®, Euthanasia-6®, Euthanasia Solution®, Sleepaway®.

* Check the local or state requirements for concentrations of these drugs.

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.450 03/10/04

TRAPS AND TRAPPING DEVICES

1. PURPOSE

To establish guidelines for WS personnel for using certain types of animal capture devices in managing wildlife damage.

2. REPLACEMENT HIGHLIGHTS

This directive replaces ADC Directive 2.450, Traps and Trapping Devices, dated 4/8/94.

3. POLICY

The use of all traps, snares, and other animal capture devices by WS employees will comply with applicable Federal, State, and local laws and regulations related to animal capture for managing wildlife damage (WS Directive 2.210, Compliance with Federal, State, and Local Laws and Regulations). Traps and trapping devices will not be used unless appropriate authorization is granted by landowner (WS Form 12A, 12B, 12C, 12D or 12F). All traps and trapping devices are to be checked as frequently as possible and no less frequently than required by law, unless specific exemptions that may be provided for in applicable wildlife regulations are obtained. All traps used by WS will be labeled (Property of U.S. Government, Property of USDA, Property of Texas, etc., as appropriate), either with an attached tag or stamped directly on the trap. Other trapping devices will be identified as required by State law.

All traps and trapping devices will be set in a manner which minimizes the chances of capturing non-target species. Non-target animals captured will be released alive if it is determined that they are physically able to survive. In the rare event that an animal determined to be a licensed, lost pet is captured, reasonable efforts will be made to notify the owner, to seek veterinary assistance if necessary, or to provide the animal to appropriate local authorities. Target animals captured in direct control projects will be dispatched immediately, removed from capture devices, and properly disposed (WS Directive 2.505, Euthanizing Wildlife; WS Directive 2.510, Fur, Other Animal Parts, and Edible Meat; WS Directive 2.515, Disposal of Wildlife Carcasses). Captured animals intended for release, relocation, or

Distribution: **Originating Office:**

captivity will be handled and transported appropriately to achieve project objectives (WS Directive 2.501, Translocation of Wildlife).

Appropriate warning signs will be posted on main entrances or commonly used access points to areas where foot-hold traps, snares, or rotating jaw (Conibear-type) traps are in use. Signs will be routinely checked to assure they are present, obvious, and readable. Signs must be removed when equipment is no longer in use.

WS recognizes the value and use of the trapping Best Management Practices (BMP) guidelines for private fur harvest and other trapping activities being developed and promulgated by State wildlife management agencies and the International Association of Fish and Wildlife Agencies. WS recognizes that these guidelines for different regions of the United States are under development and continuing revision for 23 species of North American mammals, and that they will be periodically updated based on the availability and public use of commercial capture devices. Insofar as practical, WS intends to utilize these guidelines as a basis for policy formulation, recognizing that some devices used in wildlife damage management are not commercially available and that not all devices recommended in the BMP guidelines for general public use meet the more stringent performance requirements, particularly for efficiency and durability, for use in Federal wildlife management activities.

a. Foot-hold traps and snares: Foot-hold traps or snares are not to be set closer than 30 feet from any exposed animal carcass or part thereof, having meat or viscera attached, including remains of animals previously removed from traps or snares that may attract raptors or other non-target animals. If an animal carcass could be dragged or moved by scavengers to within 30 feet of set foot-hold traps, snares, or M-44's the carcass will be secured to restrict movement (WS Directive 2.455, Scents, Baits, and Attractants). These restrictions do not apply to animal carcasses used to attract bear or mountain lion to approved capture devices or to foot-hold traps set for the purpose of live-capturing birds, as provided for in laws or regulations governing wildlife capture, insofar as such procedures are consistent with agency policy and other authorizing documents and have been approved by the WS Regional Director.

Capture devices used in restraining sets must incorporate pan-tension devices, if appropriate, to prevent or reduce the capture of non-target animals, unless such use would preclude capture of the intended target animals.
Foot-hold traps equivalent to size No. 3 or larger, when used in

restraining sets, are limited to types with smooth, rounded offset jaws that may or may not be laminated or to padded-type jaws. Foot-hold traps with teeth or spiked jaws are prohibited (WS Directive 2.335, Wolf Damage Management). Unless specifically authorized by the WS Regional Director, replacements to agency capture device inventory should be selected from the various commercially available devices or equivalents listed in regional Best Management Practices guidelines for each species.

If it is necessary to use foot-hold traps or snares under fence lines, reasonable efforts should be taken to obtain the approval of adjacent landowners; judgment should be used to avoid capture of livestock and other domestic animals.

The use of break-away locks or stops is encouraged when livestock, deer, or other large animals may be exposed to snare sets.

When setting traps and snares, caution should be used so that captured animals will not be conspicuous, particularly along public roads and trails.

Appropriate notification signs must be posted near bear and lion foot-snare sets.

Foot-hold traps will not be used to take bear.

b. Pole traps: Foot-hold traps, leg snares, or tangle snares may be set on poles or roosting structures to capture birds causing damage or considered a human health or safety risk, if such devices are authorized by the applicable depredation permit. Appropriate Federal, State, or local special purpose permits shall be obtained and in the possession of the authorized WS person when performing the capture function.

Traps should not exceed size No. 1-1/2 for most raptors. This limitation does not preclude the use of larger, modified traps to capture eagles. Trap springs should be modified to produce the lightest jaw closure sufficient to catch and hold the target raptor. Trap jaws should be sufficiently padded to reduce the possibility of injuring the raptor's legs.

To reduce unnecessary stress to the captured birds, traps will be checked at least twice daily, but not less than required by appropriate permit(s); a slide wire, or similar device, shall be used to allow the raptor to rest on the ground.
c. Rotating jaw traps: Rotating jaw (Conibear-type) traps equivalent to size 330, or with a jaw spread exceeding 8 inches, are restricted to water sets. Use of all rotating jaw traps will

comply with Federal, State, Tribal, or local laws or authorizing permits.

d. Cage traps: Use and placement of cage traps by WS personnel will comply with applicable laws, regulations and authorizing permits. In addition to other requirements, cage traps loaned to cooperators or members of the public, in addition to appropriate property labeling, will also be labeled as "Loaned Equipment." Cooperators will be responsible for replacing lost, damaged, or stolen equipment (WS Directive 4.165, Loaning Equipment).

e. Decoy traps: Decoy traps are used for capture of groups of animals, usually birds, that are attracted to other animals maintained in the trap. Ample food and water will be maintained in such traps used by WS personnel.

4. TRAPPER EDUCATION

All employees whose duties involve animal capture will participate in a trapper education course as recommended by Best Management Practices guidelines. State Directors may provide for continuing trapping education for appropriate employees on an annual basis at district, State, or regional meetings.

5. EXCEPTIONS

Unless otherwise mentioned, any exceptions to this operational policy may be authorized on a case by case basis by the WS Regional Director.

6. REFERENCES

WS Directive 2.210, Compliance with Federal, State, and Local Laws and Regulations (3/1/04)
WS Directive 2.335, Wolf Damage Management (8/10/99)
WS Directive 2.455, Scents, Baits, and Attractants (2/17/04)
WS Directive 2.501, Translocation of Wildlife (7/30/03)
WS Directive 2.505, Euthanizing Wildlife (7/28/03)
WS Directive 2.510, Fur, Other Animal Parts, and Edible Meat (10/8/03)
WS Directive 2.515, Disposal of Wildlife Carcasses (7/30/03)
WS Directive 4.165, Loaning Equipment (10/31/03)
50 CFR Part 21 - Migratory Bird Permits, Subpart D - Control of Depredating Birds
50 CFR Part 22 - Eagle Permits

Deputy Administrator

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.505 07/28/03

EUTHANIZING WILDLIFE

1. PURPOSE

To provide guidance in euthanizing wildlife.

2. REPLACEMENT HIGHLIGHTS

This directive replaces ADC Directive 2.505 Dated 03/26/93.

3. POLICY

WS will only use approved and humane methods to euthanize captured or restrained animals. WS approved I&E methods will place emphasis on human safety and the humane treatment and welfare of wildlife. Methods of euthanasia will conform to the guidelines in the 2000 Report of the AVMA Panel on Euthanasia whenever possible, and will minimize pain and suffering of the animals to be euthanized.

WS employees will ensure that the public is minimally exposed to the euthanasia process.

Following euthanasia, the animal carcass should be handled and disposed of in compliance with state and local regulations and in a manner that does not offend the general public.

5. REFERENCES

ADC Directive 2.430, Euthanizing and Immobilizing Agents (3/26/93)

WS FIREARM USE AND SAFETY

1. PURPOSE

To establish guidelines for the use of firearms in the conduct of official duties and to prescribe standard training requirements.

2. REPLACEMENT HIGHLIGHTS

This directive revises ADC Directive 2.615 dated 06/04/94.

3. DEFINITIONS

For the purpose of this directive, handguns, rifles, and shotguns are considered firearms. This policy also covers pyrotechnics pistols, net guns, paint ball guns, dart guns, air rifles, arrow guns, and crossbows.

Wildlife Services (WS) personnel are considered to be all employees, including State or official volunteers supervised by WS.

4. POLICY

WS personnel are authorized to transport, carry, and use firearms necessary to perform assigned WS duties. Use and possession of firearms must be in accordance with all Federal, State, and local laws and regulations. Because laws governing firearms vary geographically, WS personnel must become familiar with the laws of the State and locality in which they work and travel.

All firearms (i.e., handguns, rifles, and shotguns) used in the performance of official duties will be furnished with a locking device. Firearms are to be stored unloaded, and locking devices must be attached to stored weapons, whether in the employee's home, duty station, or Federal facility, if they are not stored in a locked firearm storage cabinet. Pyrotechnic pistols, net guns, paint ball guns, dart guns, air rifles, arrow guns, and crossbows will be stored unloaded in a locked, secured location.

When firearms are not in use in the field, they are to be unloaded and secured in a manner prescribed by local statute. When firearms are not in use in the field, they will be transported and stored in a location out of public view and not in window racks of Government-owned, leased, or privately-owned vehicles leased or used for official Government business. Firearms left or stored in unattended vehicles must be placed out of sight and the vehicle locked. Firearms may be carried in a more accessible manner when immediate use is necessary or likely. Firearms shall not have a cartridge in the chamber while being transported in a motor vehicle.

WS personnel will not carry concealed firearms on their person while on official duty unless authorized by the State Director or Field Station Leader and the appropriate regulatory licensing authority. Firearms will not be worn, carried, or used in an irresponsible, unsafe, or unprofessional manner.

Access to firearms stored in locked safes, gun vaults, or cabinets in Government Offices and other facilities will be limited to the State Director or Field Station Leader and/or their designees.

WS personnel who use firearms are subject to random drug testing as administered by the U.S. Department of Agriculture.

All persons acting on behalf of WS who are required or requested to use firearms are subject to the Lautenburg Domestic Confiscation Law and are required to immediately inform their supervisor if they can no longer comply with the Lautenburg Domestic Confiscation Law.

Ammunition will be stored in a locked, secure location.

5. TRAINING REQUIREMENTS

Each employee, regardless of employment status, and official volunteers required or requested to use firearms in conduct of official duties will be provided safety and handling training as prescribed in the WS Firearms Safety Manual. New employees must be provided such training or have completed a State hunter safety course or other approved firearms safety training course within the last year prior to using firearms on the job. Continuing education training on firearm safety and handling will be taken biennially by all employees who use firearms. State Directors and Field Station Leaders are responsible for ensuring that employees receive firearms safety and handling instruction as prescribed in the WS Firearms Safety Training Manual. Training must be documented using an SF-182, Request, Authorization, Agreement and Certification of Training, or similar training form.

Aerial gunner training will consist of instruction from the WS Firearm Safety Training Manual as well as other specialized instruction that my be contained in the WS Aviation Operations Manual, the WS Aviation Safety Program Manual, and the WS Aerial Operation Crew Member Training Manual.

6. REFERENCES

President Clinton's Memorandum on Child Safety Lock Devices for Handguns (03/05/97)
APHIS Safety and Health Manual (02/27/98 rev.)
MRP Drug Free Workplace Program Handbook, MRP 4792.1 (April 2001)
Lautenburg Domestic Confiscation Law (18 U.S.C. 922)
WS Firearms Safety Training Manual
WS Aviation Operations Manual (04/09/01)
WS Aerial Operations Crew Member Training Manual
WS Aviation Safety Program Manual

Deputy Administrator

U.S. DEPARTMENT OF AGRICULTURE, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, WILDLIFE SERVICE'S GUIDELINES FOR URBAN WILDLIFE DAMAGE MANAGEMENT

USDA's California Wildlife Service's Program will provide operational wildlife damage management and technical assistance to all residents of cooperating counties according to the following guidelines and prioritizations.

Procedural Guidelines

1. Requests for Service

   Requests shall be directed to the agency/department and phone number listed below.
   Agency:
   Phone Number:

2. Field Inspections

   Field Inspections will be conducted when warranted. 3

   Trapping

   - Prior to deploying traps an Agreement for Control of Wildlife Damage on Urban Properties shall be negotiated between the property/resource owner and USDA-APHIS-WS.

   - Traps will be set in sheltered areas, protected from direct sunlight and exposure to extreme cold.

   - Traps will be re-baited as necessary to maintain freshness. All captured animals will be treated humanely.

   - Traps and animals will be dealt with according to directions set forth in the Special Considerations Section of the Agreement for Control of Wildlife Damage on Urban Properties.

   No traps will be left deployed over weekends or holidays.

   - Equipment will be placed for up to two week intervals per damage incident, and work may be terminated during this time if WS determines the problem to be solved.

   In cases where public safety is threatened, and the use of padded jaw leghold traps is deemed appropriate, CDFG approval must be obtained before placing devices.

4. Disposition of Animals

- Trapped animals shall be picked up by WS as soon as possible after notification by the property/resource owner.

- Target animals will be euthanized at the discretion of the WS Specialist only. Non-target animals will be released on site.

- All euthanasia will be by methods approved by the American Veterinary Medical Association Panel on Euthanasia.

NOTE: WS does not routinely relocate target animals for the following reasons:

In some situations, it may be beneficial to translocate wildlife. Decisions to translocate wildlife will be made according to biological, economic and social impacts. Primary factors influencing translocation include availability of suitable habitat, impact (competition, predation, etc.) on the animal(s) moved as well as other species, likelihood of the animal returning, and potential for creating a similar damage/conflict situation at the new location. In California, Section 671.5 of Title 14 of the California Code of Regulations (CCR) prohibits the release of wild animals found to be diseased, or suspected of having the potential for disease, into the wild without written permission from the Fish and Game Commission.

Translocation of wild mammals is not a biologically sound practice in many situations. Considerable stress can be placed on the transported animal due to relocation-related activities and territorial disputes often resulting in low survival rates. Studies indicate that those animals that do survive seldom remain at the location where they were released. There may also be problems associated with liability the programs could incur should the translocated animal cause future damage or transmit a zoonotic disease.

The American Veterinary Medical Association, the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists oppose relocation of mammals because of the risk of disease transmission among wild mammals (especially raccoons, skunks, and foxes).

REFERENCES:

Centers for Disease Control. Compendium of Animal Rabies Control, 1990. Morbidity and Mortality Weekly Report 1990;39 (No. RR-4) :6

Nielsen, L. 1988. Definitions, considerations, and guidelines for translocation of wild animals. Pages 12-51 in L. Nielsen and R. D. Brown, eds. Translocation of Wild Animals. WISC. Humane Soc., Milwaukee.

Rosatte and Maclnnes, 1989, Relocation of City Raccoons, proceedings of the Ninth Great Plains Wildlife Damage Control Conference, Fort Collins, Colorado, April 17-20, 1989, pp87-92.

Prioritizations

First Priority

Human Health - Examples would be: A wild animal attacking a human or a skunk showing rabies symptoms.

Second Priority

Property Damage - Examples would be: Raccoons killing Koi fish, raccoons damaging turf, building/structural damage from skunks, raccoons, or opossums, beaver cutting down ornamental trees.

Third Priority

Nuisance - Examples would be: An opossum on the roof, a raccoon/skunk/opossum eating pet food out of pets' feed dishes, a skunk (or its odor) in a yard at night, an opossum running on top of the fence causing the dog to bark.

WS is not responsible for:

a. Problems associated with domestic animals, dogs, cats, etc.

b. Picking up road killed animals or others that die of natural causes.

c. Animals captured in traps other than those owned and operated by WS.

CA-WS Directive

2.402 4/1/02

EUTHANIZING/IMMOBILIZING AGENTS

1. PURPOSE

To provide guidelines for California WS employees using drugs to euthanize or immobilize captured or restrained animals.

2. BACKGROUND

All, or most, euthanasia or immobilizing drugs are classified as controlled substances by the U.S. Drug Enforcement Administration. Drugs regulated under the Controlled Substance Act have the potential for being dangerous and addictive, e.g. narcotics, sedatives, tranquilizers, etc. The Controlled Substance Act of 1970 places dangerous drugs in categories known as schedules and specifies regulations for their possession, use and dispensing. Both FDA and DEA set standards for accountability and storage requirements.

3. POLICY

Training: All WS personnel using drugs to euthanize or immobilize wildlife shall be adequately trained and certified in the proper use of the drug.

Storage: All controlled substances must be kept in a securely locked, substantially constructed cabinet or safe. A cabinet may be defined as a lockable tool box or the lockable cab of a vehicle. Bottles, syringes and needles shall not be stored where visible to the public.

Records: All use of euthanizing/immobilizing drugs shall be recorded on the appropriate log for the drug. The record shall contain the date used, the location of the use, the species of animal euthanized/immobilized, and the amount used to euthanize/immobilize the animal or bird.

Disposal of Animals/Birds: All disposal of birds/mammals euthanized with drugs shall be in accordance with procedures defined in the guidelines for use of the particular drug.

Disposal of Needles: All needles used for euthanasia/immobilization shall be removed from the syringe and placed in an approved Sharps container. When full, all Sharps containers shall be returned to the District Supervisor or the State Office for transfer to a disposal site.

Disposal of Syringes: All syringes used for euthanasia/immobilization shall either be destroyed by incineration or returned, in a Sharps container, to the District Supervisor or the State Office.

Disposal of Empty Bottles: All empty euthanasia/immobilization drug bottles shall be returned to the District Supervisor or State Office. (Empty bottles can be rinsed, following removal of the stopper, and crushed for disposal).

5. REFERENCES

ADC Directive 2.505, Euthanizing Wildlife (3/6/93)

ADO Directive 2.430, Euthanizing and Immobilizing Agents (3/26/93)

Proper Handling and Storage of Sodium Pentobarbital Euthanasia(training material handout)

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services Guidelines for Urban Wildlife Damage Management

1986 Report of the AVMA Panel on Euthanasia

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Service Services - California

CA-WS Directive

2.501 4/1/02

TRANSLOCATION OF WILDLIFE

1. PURPOSE

To provide guidelines for California WS employees on the translocation of wildlife.

2. REPLACEMENT HIGHLIGHTS

This directive replaces State Office memo dated November 6, 1989, titled, "Policy on the Relocation of Wildlife".

3. BACKGROUND

In some situations, it may be beneficial to translocate wildlife. Decisions to translocate wildlife will be made according to biological, economic and social impacts. Primary factors influencing translocation include availability of suitable habitat, impact (competition, predation, etc.) on the animal(s) moved as well as other species, likelihood of the animal returning, and potential for creating a similar damage conflict situation at the new location.

Translocation of wild mammals is not a biologically sound practice in many situations. Considerable stress can be placed on the transported animal due to relocation-related activities and territorial disputes often resulting in low survival rates. Studies indicate that those animals that do survive seldom remain at the location where they were released. There may also be problems associated with liability the programs could incur should the translocated animal cause future damage or transmit a zoonotic disease.

The American Veterinary Medical Association, the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists oppose relocation of mammals because of the risk of disease transmission among wild mammals (especially raccoons, skunks. and foxes).

California Fish and Game Commission regulations (Title 14), Section 671.6, prohibit release of any wild animal that: 1) is not native to California; 2) is found to be diseased, or there is reason to suspect may have potential for disease; 3) maybe genetically detrimental to agriculture or to native wildlife; or 4) has not been successfully introduced prior to 1955 without written permission of the commission

4. POLICY

It is the policy of the California WS program to prohibit the relocation of wildlife without the specific written authorization of the California Department of Fish and Game.

5. REFERENCES

ADC Directive 2.501, Translocation of Wildlife (3/26/93)

California Department of Fish and Game Code, Sections 4152, 4180, and 3005.5.

Rosatte, R.C., and C.D. Macinnes, 1989. "Relocation of City Raccoons," Proceedings of the Ninth Great Plains Wildlife Damage Control Conference, Fort Collins, Colorado, April 17-20,1989, pp. 87-92.

U.S. Department of Agriculture, Animal and Plant Inspection Service, Wildlife Services Guidelines for Urban Wildlife Damage Management.

California Code of Regulations, Title 14. Natural Resources, Division 1. Fish and Game Commission - Department of Fish And Game Section 671.6.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

California/Nevada Operations Office
2800 Cottage Way, Suite W-2606
Sacramento, CA 95825

In Reply Refer to:
CNO-ES

MAY 08 2007

Craig Coolahan
State Director
Animal and Plant Health Inspection Service
Wildlife Services
California State Office
3419 A, Arden Way
Sacramento, CA 95825

Re: Amended Biological Assessment for APHIS-WS activities to protect livestock, property, human health and safety, and natural resources in the State of California

Dear Mr. Coolahan:

Thank you for applying the recent changes and conditions to your program's proposed action in the document entitled: "BIOLOGICAL ASSESSMENT; USDA Animal and Plant Health Inspection Service, California Wildlife Services Program; Part II; Integrated Wildlife Damage Management To Protect Livestock, Property, Human Health and Safety, and Natural Resources In the State of California". As indicated in your letter of February 7, 2007, this biological assessment (dated February 7, 2007) replaces "Part II" of the original (July 8, 2004) version.

This letter serves to designate you and your approved staff as agents of the Service for the purpose of harassing brown pelicans that constitute a demonstrable threat to aviation safety at United States Navy facilities in San Diego County. Authority for this action is provided under 50 CFR 17.21 and is effective upon signature of this letter. Pursuant to 50 CFR 17.21(c)(3)(iv) any employee or agent of the Service, who is designated by his agency for such purposes, may take endangered wildlife without a permit if such action is necessary to remove specimens which constitute a demonstrable but non-immediate threat to human safety. This agent status is conditional upon full compliance with the terms outlined and included in your assessment (Pages 60-61).

In accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and implementing regulations (50 CFR 17.21), this letter also represents a partial response to your original request for formal consultation and/or concurrence with findings under section 7 of the Endangered Species Act and addresses only those activities identified in the assessment dated February 7, 2007.

We concur with the determinations in your Biological Assessment that the types of activities (employed with the described avoidance and minimization measures) as described will either have no effect or will not adversely affect the following identified endangered or threatened species. No further consultation pursuant to the Endangered Species Act of 1973 is required with the Service for these particular activities (on these particular species), unless new information reveals effects of the proposed action not considered herein.

1. **Short-tailed albatross** (*Phoebastria (=Diomedea) albatrus*)
2. **Coastal California gnatcatcher** (*Polioptila californica californica*)
3. **San Clemente loggerhead shrike** (*Lanius ludovicianus mearnsi*)
4. **San Clemente sage sparrow** (*Amphispiza belli clementeae*)
5. **Peninsular bighorn sheep** (*Ovis canadensis*)
6. **Sierra Nevada bighorn sheep** (*Ovis canadensis californiana*)
7. **Point Arena mountain beaver** (*Aplodontia rufa nigra*)
8. **San Bernardino Merriam's kangaroo rat** (*Dipodomys merriami parvus*)
9. **San Joaquin kit fox** (*Vulpes macrotis mutica*)
10. **Tipton kangaroo rat** (*Dipodomys nitratoides nitratoides*)
11. **Stephen's kangaroo rat** (*Dipodomys stephensi (incl. D. cascus)*)
12. **Buena Vista Lake shrew** (*Sorex ornatus relictus*)
13. **Fresno kangaroo rat** (*Dipodomys nitratoides exilis*)
14. **Giant kangaroo rat** (*Dipodomys ingens*)
15. **Morro Bay kangaroo rat** (*Dipodomys heermanni morroensis*)
16. **Pacific pocket mouse** (*Perognathus longimembris pacificus*)
17. **California red-legged frog** (*Rana aurora draytonii*)
18. **California tiger salamander** (*Ambystoma californiense*)
19. **Santa Cruz long-toed salamander** (*Ambystoma macrodactylum croceum*)
20. **Alameda whipsnake (=striped racer)** (*Masticophis lateralis euryxanthus*)
21. **Blunt-nosed leopard lizard** (*Gambelia silus*)
22. **Coachella Valley fringe-toed lizard** (*Uma inornata*)
23. **Giant garter snake** (*Thamnophis gigas*)
24. **Island night lizard** (*Xantusia riversiana*)
25. **San Francisco garter snake** (*Thamnophis sirtalis tetrataenia*)
26. **Tidewater goby** (*Eucyclogobius newberryi*)
27. **Unarmored threespine stickleback** (*Gasterosteus aculeatus williamsoni*)
28. **Conservancy fairy shrimp** (*Branchinecta conservation*)
29. **Longhorn fairy shrimp** (*Branchinecta longiantenna*)
30. **Vernal pool fairy shrimp** (*Branchinecta lynchi*)
31. **San Diego fairy shrimp** (*Branchinecta sandiegonensis*)
32. **Riverside fairy shrimp** (*Streptocephalus woottoni*)
33. **Armargosa vole** (*Microtus californicus scirpensis*)
34. **Inyo California towhee** (*Pipilo crissalis eremophilus*)

We also concur with the determinations for the following species, but wish to clarify that an "active coyote den" is defined as having met the observance standard as described on Page 65: "…meaning coyotes must be positively observed (by sight or sound) by qualified personnel at the time of or immediately prior to treatment":

35. **Arroyo (=arroyo southwestern) toad** (*Bufo californicus (=microscaphus)*)
36. **Desert slender salamander** (*Batrachoseps aridus*)
37. **Mountain yellow-legged frog** (*Rana muscosa*)

We also concur that these actions are not likely to adversely affect the **riparian (San Joaquin Valley) woodrat** (*Neotoma fuscipes riparia*) as long as repellent devices are limited to audio repellents (no pyrotechnics) and are not employed directly in riparian areas.

We also concur that the proposed actions are not likely to adversely affect the **riparian brush rabbit** (*Sylvilagus bachmani riparius*), but did not find the find the map attached to the assessment as indicated. The range map is attached for your use in implementing the avoidance measures as described in your assessment.

We also concur that proposed activities are not likely to adversely affect the **San Francisco garter snake** (*Thamnophis sirtalis tetrataenia*), but would like to clarify that while the application "observation standard" is essential to this determination, it is not part of the 1992 BO "reasonable and prudent measure" as referenced in your document on Page 72.

We would like to thank you for your patience and flexibility throughout this process. We look forward to working with you to revisit "Part I" of your original Biological Assessment regarding APHIS-WS activities to benefit threatened and endangered species. Please contact Vicki Campbell, Deputy Division Chief of our Section 7, Habitat Conservation and Contaminants Division at 916-414-6464 for the formal phase of this consultation.

Sincerely,

Paul Henson

Paul Henson
Assistant Manager, Ecological Services

Attachment

cc:
Ventura Fish and Wildlife Office
Sacramento Fish and Wildlife Office
Carlsbad Fish and Wildlife Office

USDA

United States Department of Agriculture

Animal and Plant Health Inspection Service

Wildlife Services

California State Office

3419 A, Arden Way
Sacramento, CA
95825

(916) 979-2675

Carrie Thompson
U. S. Fish and Wildlife Service
California/Nevada Operations Office
2800 Cottage Way, W-2606
Sacramento, CA 95825

February 7, 2007

Re: Amended Biological Assessment for APHIS-WS activities to protect livestock, property, human health and safety, and natural resources in the State of California

Dear Ms. Thompson:

This letter is to inform you that we have amended our Biological Assessment (BA) (attached) in response to the U.S. Fish and Wildlife Service's (Service) request to incorporate its conditions and changes required for concurrence with our determinations made on 7/8/04. The changes and conditions contained in your 1/26/07 communication with our agency (an undated draft letter attached to your 1/26/07 email to Shannon Hebert, APHIS, WS) are now reflected in the attached BA (amended 2/7/07).

In a meeting with you and Shannon Hebert (APHIS-WS) on 7/5/06, I agreed to a partial response to our request for formal consultation and concurrence with findings under section 7 of the Endangered Species Act (submitted 7/8/04). The initial request and Biological Assessment (BA) (7/8/04), was organized into two parts: 1) APHIS-WS activities to benefit threatened and endangered species and 2) APHIS-WS activities "…to protect livestock, human health and safety, property, agriculture, and natural resources...from wildlife conflicts in California…" The second part (Part II – Protecting Livestock, Property, Human Health and Safety and Natural Resources, pages 56-76 of the 2004 BA), is contained in the attached BA, now fully amended per your request, with the first portion (APHIS-WS activities to benefit threatened and endangered species (Part I)) now omitted.

Please note that the attached BA contains a request for agent status to haze brown pelicans from airports along with all of the conditions described in the draft letter attached to your 1/26/07 email to Shannon Hebert.

Finally, we agree in the BA to adopt the range maps provided by the Service (attached to the BA) for application to listed species. We wish to note that we have agreed to use map provided for the San Joaquin kit fox range as a general guide because there is currently no more precise interpretation of occupied range. It is our intent to seek to gather new information as it becomes available to present a more precise interpretation of occupied range of the San Joaquin kit fox. Prior to our use of new information relating to the BA, we would seek USFWS agreement that the new information is acceptable to use in lieu of the more general range map.

Thank you once again for your dedication and assistance with this portion of our consultation needs.

Sincerely,

Craig Coolahan

Craig Coolahan
State Director
Animal and Plant Health Inspection Service
Wildlife Services
California State Office
3419 A, Arden Way
Sacramento, CA 95825

cc Shannon Hebert

Encl. Biological Assessment

AMENDMENT TO

BIOLOGICAL ASSESSMENT

USDA Animal and Plant Health Inspection Service, California Wildlife Services Program

Part II
Integrated Wildlife Damage Management
To Protect Livestock, Property, Human Health and Safety, and Natural Resources

In the State of California

Prepared by:
U. S. Department of Agriculture,
Animal and Plant Health Inspection Service
APHIS-WS, Sacramento, California

Launch Internet Explorer Browser.lnk

Revised May 9, 2012

PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this amended Biological Assessment (BA) is to update the evaluation of the effects of the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS) livestock, human health and safety, property, and natural resource protection program in the State of California, on the continued existence of Federally listed California condor, San Joaquin kit fox, desert tortoise, and gray wolf which may be in the project area or that may be affected by activities occurring within the project area. This BA is attached to Part I which consider programs which are specifically developed to protect listed species from predation or other threats. Those activities are distinct and are therefore considered separately.

CONSULTATION HISTORY

In 1997 USFWS completed four separate APHIS-WS District level informal consultations pursuant to ESA reviewing its wildlife damage management program to protect livestock, human health and safety, property, and natural resource in the State of California.

On August 23, 2002, APHIS-WS requested informal consultation to update earlier consultations.

On December 8, 2003, APHIS-WS submitted a new informal consultation with updated information.

On July 8, 2004, WS requested Formal Section 7 consultation on all of its programs and rescinded the prior requests for informal consultation. The BA was divided into two parts: Part I reviewed a program to protect threatened and endangered species from predation in California; and Part II reviewed the wildlife damage management program to protect livestock, human health and safety, property, and natural resource in the State of California

On May 2007 USFWS completed Part II, Informal Consultation on the APHIS-WS wildlife damage management program to protect livestock, human health and safety, property, and natural resource in the State of California.

September 8, 2008 Wildlife Services submitted an amendment to USFWS to update its July 8, 2004 request (relating to Part II and the May 2007 correspondence).

April 8, 2009. Wildlife Services submitted an updated BA to USFWS to update its July 8, 2004 request (relating to Part I).

This May 9, 2012 amendment revises and replaces the September 8, 2008 amendment with new program information.

We request completion on both Parts I and II of our request for consultation.

PROPOSED ACTION

Project Area

The analysis area of this amended BA includes occupied habitat of the San Joaquin kit fox, California condor, and desert tortoise, and potentially occupied habitat of the gray wolf. If and when recognized occupied ranges of these species expand, the analysis area and any agreed upon measures which result from this ESA Section 7 consultation would include those new areas.

Currently, California condor range includes those areas as described in Ridley-Tree Condor Preservation Act. Sec. 2. Nonlead Centerfire Rifle & Pistol. This area is shown on a map obtained from the California Department of Fish and Game's webpage downloaded from: http://www.dfg.ca.gov/wildlife/hunting/condor/docs/Ridley-TreeCondorPreservationAct.pdf and shown in Attachment 1.

A map of occupied habitat of the San Joaquin kit fox was provided by the USFWS in its May 8, 2007 informal consultation with APHIS-WS.

The range of the Mojave population of the desert tortoise in California includes portions of the Mojave Desert in parts of Inyo, Kern, Los Angeles, San Bernardino and Riverside counties, and portions of the Colorado desert subdivision of the Sonoran Desert which includes Imperial County and parts of San Bernardino and Riverside counties (USFWS 1994).

A GPS collared gray wolf (OR-7), has recently crossed into California into Modoc, Siskiyou, Shasta and Lassen counties. The animal is a young male from a pack in northeast Oregon, where several packs have become established. GPS data show the location of the wolf in California (http://nrm.dfg.ca.gov).

As stated in Part II APHIS-WS operational activities are conducted only after a request is received for assistance in resolving a wildlife damage situation and only after a thorough investigation has been conducted to identify the species responsible for the damage. The goal of APHIS-WS operational activities is to reduce or eliminate further damage. The APHIS-WS program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis. None of the proposed activities will result in habitat modification.

General Discussion

The May 8, 2007 consultation on Part II of the APHIS-WS BA discusses APHIS-WS' proposed action to use the full range of authorized wildlife damage management methods in accordance with APHIS-WS Directives (Part II, Appendix A). This amendment focuses on the discussion of the use of lead in California condor range, the use of neck snares in San Joaquin kit fox range, predator damage management methods to protect livestock in the range of the desert tortoise, and wildlife damage management in potentially occupied range of the gray wolf in California.

Existing Condition

During previous informal consultations with the UFSWS[1] APHIS-WS noted that the range of operational wildlife damage management activities conducted was on less than 3.1 to 10.3 percent of the area of lands under which we had cooperative agreements. We do not anticipate substantial changes (either increase or decrease) in the amount of acreage where activities are conducted since APHIS-WS's last consultation with the FWS.

EFFECTS OF PROPOSED ACTION

The primary potential for impacts on any listed species would be associated with accidental injury or death of a non-target California condor, San Joaquin kit fox, desert tortoise or gray wolf due to efforts to control predation on livestock by predators and during efforts to reduce other damage caused by wildlife such as bird strike hazards at airports, damage to property, threats to human health and safety, and other damage.

EFFECTS OF THE PROPOSED ACTION ON INDIVIDUAL SPECIES

California Condor (*Gymnogyps californianus*), Endangered (32 FR 4001, March 11, 1967)

The California condor is a member of the family Cathartidae or new world vultures. Weighing approximately 18-23 pounds and having a wingspan of 9 ½ feet, the condor is one of the largest flying birds in the world. It is also one of the rarest. Adults are black with white underwing linings and white edges in the upper secondary coverts. As with most vultures, the head and neck are unfeathered; skin of the head and neck is a gray color in juvenile birds, grading into various shades of red and orange as the bird matures. Males and females are similar in both size and plumage. Condors are exclusively carrion feeders, foraging in foothill grasslands, oak savannahs, and other open terrain allowing for easy approach and visual location of food. It nests in caves on steep cliff faces, usually not breeding until age six. One young is raised per year, and the chick fledges at about six months of age (Koford, C.B. 1953. The California Condor. Natl.Audubon Soc.Res.Report No.4:1-154)

Critical habitat for the California condor was designated (41 FR 41914). WS does not anticipate any impacts from this WDM activity conducted by WS personnel in the designated critical habitat of the California condor in California, therefore, WDM activity is not likely to destroy or adversely modify the designated critical habitat of the California condor in these areas.   As of 2008, there are a reported 68 condors in the wild in California (http://www.dfg.ca.gov/wildlife/species/t_e_spp/condor/docs/StatusReport-5-31-08.pdf). As increasing numbers of reintroduced condors attain sexual maturity (five to seven years of age), there has been an increase in courtship activities and nesting attempts in the wild. The first eggs laid by reintroduced condors occurred in 2001, but both nests failed. Since 2002 ten eggs have been laid by seven pairs in California, while only one chick has fledged. Seven nestlings have died prior to fledging, two chicks were taken into captivity, and one egg was lost to predation.

[1] FWS reference numbers 1-1-97-I-1579, 1-1-97-I-831, 1-1-97-I-98 and 1-96-I-1795

The following WDM methods which are used to reduce damage to livestock have potential to result in incidental take of a California condor when used by WS personnel conducting WDM activities in California condor habitat: M-44 devices, strychnine, and shooting of predators.

M-44 Devices

The M-44 (sodium cyanide is the active ingredient) is a spring-activated ejector device developed specifically to reduce damage from coyotes and other wild canid predators. M-44s may only be used for control of coyotes, red and gray foxes, and feral dogs that are vectors of communicable diseases, and depredate livestock, poultry, and federally listed endangered and threatened species. Fetid baits used with M-44 devices are highly selective for canids but there have been incidences of other species, including bobcat, activating the devices. M-44 devices must be used in accordance with the Environmental Protection Agency label use restrictions, which prohibit use in areas where federally listed threatened and endangered animal species might be adversely affected. M-44 use in California is not allowed, except for the possible use on Native American Indian lands. No M-44's will be used in California within the range of the California condor.

Strychnine

WS and EPA label use restrictions prohibit the above ground use of strychnine for rodent control. WS does not propose to use strychnine in California.

Shooting

Shooting is a species-specific activity that should not result in the wounding or killing of non-target species. Shooting can be done from aircraft, in conjunction with shooting, stalking or opportunistic encounter. Shooting from an aircraft is effective and species specific and should not pose a threat to California condors. However, condors could be susceptible to lead poisoning when they scavenge a carcass along with the lead shot or bullet fragments that remain in the muscle tissue. WS primarily utilizes nontoxic shot (e.g., copper plated, tungsten, steel, etc.) in California condor areas to reduce the potential for lead poisoning and eliminate the need for carcass retrieval of the target species. The exception to this practice is when euthanizing bears caught in culvert traps. WS uses lead bullets in this case as a safety precaution to avoid ricochet. Bear carcasses are disposed of in such as manner as to be out of sight and inaccessible to soaring birds. With this exception, APHIS-WS conforms to California State regulations (Section 353, Title 14, CCR and Section 475, Title 14, CCR) and does not use lead bullets within the range of the California condor to take deer, bear, wild pig, elk, or coyotes, ground squirrels, and other non-game wildlife. By incorporating applicable limitations on its use of lead projectiles within designated California condor range, Wildlife Services would be precluded from the need to recover coyote carcasses shot with lead projectiles as was previously required.

Leghold traps and snares.

APHIS-WS does not place leghold traps or snares within 30 feet of a carcass being used for control purposes.

APHIS-WS will maintain regular annual (or more frequent) contact and coordination with the appropriate Federal and State agencies to keep apprised of locations and information on the presence of California condors

CONCLUSION

Because the California APHIS-WS program does not use M-44s, strychnine or lead projectiles within the range of the California condor, and because leghold traps and snares are not set within 30 feet of a carcass being used for control purposes, and because APHIS-WS will maintain regular contact with the appropriate Federal and State agencies to keep apprised of location and information on the presence of condors, the APHIS-WS program is **not likely to adversely affect the California condor in California**.

San Joaquin kit fox (*Vulpes macrotis mutica*)- (Federally Endangered 3/11/67)

The San Joaquin kit fox (Vulpes macrotis mutica) is the smallest fox in North America, with an average body length of 20 inches and weight of about 5 pounds. San Joaquin kit foxes are lightly built, with long legs and large ears. Their coat ranges from tan to buffy gray in the summer to silvery gray in the winter. Their belly is whitish and their tail is black-tipped.

Diet varies geographically, seasonally and annually, based on abundance of prey. In the southern part of the range, one-third of the kit fox diet consists of kangaroo rats (Dipodomys spp.), pocket mice (Perognathus spp.), white-footed mice (Peromyscus spp.) and other nocturnal rodents. In the northern portion of the range (San Joaquin, Alameda and Contra Costa counties), kit foxes most often prey on California ground squirrels (Spermophilus beecheyi). Kit foxes also prey on black-tailed hares (Lepus californicus), San Joaquin antelope squirrels (Ammospermophilus nelsoni), desert cottontails (Sylvilagus audubonii), ground-nesting birds and insects.

Dens are used for temperature regulation, shelter from adverse weather and protection from predators. Kit foxes either dig their own dens, use those constructed by other animals, or use human-made structures (culverts, abandoned pipelines, or banks in sumps or roadbeds). Kit foxes often change dens and many dens may be used throughout the year. However, evidence that a den is being used by kit foxes may be absent.

Kit foxes can breed when one year old. Adult pairs stay together all year. During September and October, females begin to clean and enlarge their pupping dens. Mating occurs between December and March. Litters of two to six pups are born in February or March. Pups emerge from the den after about a month.

DISTRIBUTION:

In the San Joaquin Valley before 1930, the range of the San Joaquin kit fox is believed to have extended from southern Kern County north to Contra Costa County on the west side and near La Grange, Stanislaus County, on the east side. Until the 1990s, Tracy was the farthest northwest record. We now have records from the Antioch area of Contra Costa County.

Historically, San Joaquin kit foxes occurred in several San Joaquin Valley native plant communities. In the southern most portion of the range, these communities included Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland.

By 1930, the kit fox range had been reduced by more than half, with the largest portion remaining in the southern and western parts of the Valley. By 1958, an estimated 50% of the Valley's original natural communities had been lost, due to extensive land conversions, intensive land uses, and the use of pesticides. In 1979, only about 6.7% of the San Joaquin Valley's original wildlands south of Stanislaus County remained untilled and undeveloped.

Today many of these communities are represented only by small, degraded remnants. Kit foxes are, however, found in grassland and scrubland communities, which have been extensively modified by humans with oil exploration, wind turbines, agricultural practices and/or grazing. The kit fox population is fragmented, particularly in the northern part of the range.

THREATS:

Kit foxes are subject to competitive exclusion or predation by other species, such as the nonnative red fox (Vulpes vulpes), coyote (Canis latrans), domestic dog (Canis familiaris), bobcat (Felis rufus), and large raptors.

Loss and degradation of habitat by agricultural, industrial, and urban development's and associated practices continue, decreasing the carrying capacity of remaining habitat and threatening kit fox survival. Such losses contribute to kit fox declines through displacement, direct and indirect mortalities, barriers to movement, and reduction of prey populations.

BASIS FOR AMENDMENT TO INFORMAL CONSULTATION ON SAN JOAQUIN KIT FOX

APHIS-WS concluded informal consultation on May 8, 2007 on program effects on the San Joaquin kit fox. APHIS has agreed to implement all restrictions on tools as described within its BA as adopted and amended by the USFWS. The neck snare was restricted from use within the range of the San Joaquin kit fox in an expanded range as described by USFWS on a map attached to the May 8, 2007 consultation. The inability to use the neck snare within the USFWS designated range of the San Jaoquin kit fox restricts the ability of APHIS-WS to deliver effective wildlife damage management services in some areas.

The purpose of this amendment is to reevaluate the use of the neck snare within the range of the San Joaquin kit fox to more precisely examine the risks; determine if the APHIS-WS program may use the tool in some cases to more effectively assist the public and government agencies with requests for assistance in resolving wildlife conflicts; and to determine if reasonable and prudent measures to reduce risks to the San Joaquin kit fox may be appropriate.

APHIS-WS NECK SNARE USE AND RISKS

APHIS-WS has reviewed its use of neck snares within Kern, Madera, Mariposa, Merced, and Stanislaus counties from 1993 to 2007 based on information compiled in its Management Information Systems database. These five counties contain occupied habitat of the San Joaquin kit fox as reflected on the San Joaquin kit fox map provided by the USFWS in its May 8, 2007 informal consultation on the kit fox. Table 1. presents the number of snares set for coyotes per year and by county.

Table 1. Number of Snares Set for Coyotes In or Around San Joaquin Kit Fox Habitat

Year	Kern	Madera	Mariposa	Merced	Stanislaus	TOTAL
1993	17	25	2	19	12	75
1994	0	8	8	42	2	60
1995	3	17	21	63	13	117
1996	36	7	3	15	3	64
1997	107	26	7	17	4	161
1998	31	50	37	21	5	144
1999	244	214	210	41	5	714
2000	204	148	126	31	1,189	1,698
2001	189	225	188	14	481	1,097
2002	129	150	26	5	510	820
2003	235	94	151	0	473	953
2004	488	54	85	8	471	1,106
2005	70	71	35	2	728	906
2006	79	112	66	38	178	473
2007	221	153	57	26	152	609
TOTAL	2053	1354	1022	342	4,226	8,997

Table 1 shows that over the 15 year period in five counties, a total of 8,997 snares were set. Until it received the expanded occupied range map from the USFWS on May 8, 2007, Wildlife Services used the State of California's definition of occupied habitat for the San Joaquin kit fox found in California Code of Regulations, Title 14. Title 14 defined a smaller area compared with the USFWS map, therefore, a portion of the snares set as shown in Table 1 were set within the expanded range identified by the USFWS in their May 8, 2007 communication with APHIS-WS since it was outside of the State's definition. An unknown but substantial number of snares that are tallied in Table 1 were likely set in the USFWS identified range of the San Joaquin kit fox.

No kit foxes have been captured in snares set by Wildlife Services in the counties and during the time period shown in Table 1. Wildlife Services believes that San Joaquin kit foxes may avoid snares set for coyotes for two reasons: one possible reason may have been that kit foxes may avoid interactions with coyotes since coyotes are a significant predator of kit fox; another reason may relate to the technique in which the APHIS-WS sets snares for coyotes in habitat types used by the San Joaquin kit fox. Snares set for coyotes are set in active coyote travel ways after coyote damage to a resource, such as livestock, has been identified. Snares are usually set in a crawl hole under a fence. Kit fox are likely to avoid confrontation with coyotes and thus may avoid the area. Another possible reason that San Joaquin kit fox may not have been captured by a neck snare is that in the event a kit fox did enter a snare set for a coyote, the small size of the kit fox may have allowed it to pass through the 10-inch diameter snare loop used to capture coyotes, and thus it did not trigger the snare.

While there is likely to be some level of risk that a kit fox could be captured in a neck snare set for coyotes, the risk may be reduced based on the method used to capture coyotes in this type of terrain. In addition, the Wildlife Services program in California checks snares every 24-hours so that they are in no way left unattended.

As documented in a letter dated August 13, 2008 from Fred Rinder of Fresno County's Department of Agriculture to Craig Coolahan, we have learned that Fresno County agents had regularly used neck snares to capture coyotes within the range of the San Joaquin kit fox prior to 1991 in Fresno County, and have not captured kit fox. As stated in the letter: "Routinely, (Fresno County Department of Agriculture's) . . .management activities were conducted west of I-5 to the Fresno County line, north to Merced County and south to Kings County. During this time, our staff did not snare any San Joaquin kit fox in any of the areas in which wildlife damage management activities were performed."

Finally, there may be some benefit to kit fox from removing coyotes since coyotes compete for prey and are a predator of the kit fox.

CONCLUSION

While the California Wildlife Services program has never captured a San Joaquin kit fox in a neck snare set for coyotes, the use of the coyote neck snare in occupied habitat **may affect and is likely to adversely affect the San Joaquin kit fox.** Therefore, Wildlife Services requests formal consultation on this species for the use of neck snares for coyotes.

Desert Tortoise (*Gopherus agassazii*), Threatened (55 FR 12178-12191 April 2, 1990)

The desert tortoise is a typical land-dwelling tortoise. Tortoises forage primarily on native winter and summer annuals, perennial grasses, cacti, and other vegetation. The desert tortoise is most commonly found within the desert scrub vegetation type, primarily creosote bush scrub vegetation, but also succulent scrub, cheesebush scrub, blackbush scrub, hopsage scrub, shadscale scrub, microphyll woodland, and Mojave saltbush-allscale scrub. It can also occur in scrub-steppe vegetation types of the desert and semidesert grassland complex (USFWS 1994). Throughout most of the Mojave Region, tortoises occur most commonly on gently sloping terrain with soils ranging from sand to sandy-gravel, and scattered shrubs where there is abundant inter-shrub space for growth of herbaceous plants. Tortoises can also be found in steeper, rockier areas (Gardner and Brodie 2000).

Desert tortoises overwinter in burrows and are active from the late winter to spring through fall. They spend much of the active season in burrows. (USFWS 2011).

Critical habitat for the Mojave Population of the desert tortoise was designated February 8, 1994 (59 FR 5820-5866). WS does not anticipate any impacts in the designated critical habitat of the desert tortoise because the proposed activity in desert tortoise habitat to protect livestock would be extremely limited in scope, and would occur on existing roadways and trails or previously disturbed areas where livestock are grazing. Therefore WDM activity is not likely to destroy or adversely modify the designated critical habitat of the Mojave population of the desert tort

The following WDM activities used to reduce predator damage to livestock in occupied desert tortoise habitat have the potential to affect the desert tortoise: vehicle travel, neck snares, cage traps, and Collarums.

APHIS-WS anticipates that most work to protect livestock would be done in winter months when tortoises are not active; however some work may occur during the tortoises active season. WS work to protect livestock in the range of the desert tortoise is limited to infrequent visits to Bureau of Land Management grazing allotments in Kern and extreme northeast Los Angeles counties, but may potentially include other areas upon request.

<u>Vehicle Use</u>
Vehicles, including OHVs, are used to transport WS personnel and equipment to WDM implementation sites. Vehicles may crush tortoises. WS use of vehicles is unlikely to affect tortoises because vehicles are kept to roadways or existing trails and staff are instructed to be diligent to the presence of desert tortoise. In desert tortoise habitat, vehicles will travel at the posted speed, or where not posted or on unpaved roads, at a maximum speed of 25 mph. When vehicles are parked in desert tortoise habitat during its active season, the area underneath and adjacent to the vehicles is checked prior to moving the vehicles to avoid crushing a desert tortoise that may be attracted to the shade of the vehicle.

<u>Neck Snares</u>
In accordance with WS policy (WS Policy Directive 2.450), all traps and trap-like devices used by WS will be set in a manner that minimizes the potential of capturing non-target animals such as desert tortoise. Neck snares would be unlikely to capture a desert tortoise since they would be placed a minimum of 6 to 8 inches above ground, thus precluding entry of a tortoise.

<u>Cage Traps</u>
Cage traps may infrequently be used to capture a mountain lion or other predator. The cage trap, a rectangular box trap made from wood or heavy gauge mesh wire, is used to capture animals alive. Cage traps usually work best when baited with foods attractive to the target animal. Cage traps are checked frequently to ensure that captured animals are not subjected to extreme environmental conditions. While it is possible that a desert tortoise may enter a cage trap, it would be unlikely due to the time of year that cage traps would likely be used (primarily during the inactive period), and due to the low potential to use a trap in occupied desert tortoise habitat. In the unlikely event that a tortoise is captured in a cage trap, the time of year the trap would likely be used (outside of the summer season), combined with daily or more frequent checking,

would allow the wildlife specialist to release the tortoise unharmed.

Collarum

The Collarum is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes. It is activated when an animal bites and pulls a cap with a lure attractive to coyotes, whereby the snare is projected from the ground up and over the head of the coyote. As with other types of snares, the use of the Collarum device to capture coyotes is greatly dependent upon finding a location where coyotes frequently travel where the device can be set. Collarums must also be set in locations where the likelihood of capturing non-target animals is minimized. Furthermore, it is unlikely that a desert tortoise would activate a Collarum due to the canine specific baits used, and due to the need for the target animal to pull up on the cap to spring the snare.

Additional Considerations

In addition to the routine minimization measures indicated above, WS would not leave litter or animal carcasses behind that may attract ravens, a known predator of juvenile desert tortoises.

CONCLUSION

The California APHIS-WS program proposes minimal work to protect livestock from predators in desert tortoise habitat. Any effects are likely to be beneficial by removing predators that may prey on desert tortoises. For the reasons discussed above, APHIS-WS program is **not likely to adversely affect the desert tortoise in California**.

Citations

Gardner, T. J. and E. D. Brodie, Jr. 2000. The occupation of steep slopes by desert tortoises (Gopherus agassizii) in the western Mojave Desert: A description of occupied habitats, habitat use, and desert tortoise density. Final report.

U.S.Fish and Wildlife Service. 1994. Desert tortoise (Mojave population) recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

U.S. Fish and Wildlife Service. 2011. Revised recovery plan for the Mojave population of the desert tortoise (Gopherus agassizii). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

Gray wolf (*Canis lupus*) – Endangered 39 FR: 1175, January 4, 1974

Existing Condition

The GPS collared gray wolf (OR-7) currently located in Northern California is from a pack in northeast Oregon where several packs have become established. There are more than 1,600 wolves in the northern Rocky Mountains following the federal reintroduction effort in the mid-1990s. While there is no way to predict whether this wolf will remain in California or travel elsewhere, it is likely that it is a matter of time before more wolves disperse into California as the Oregon wolf population grows. While this is the first documented wolf in California since the recovery effort, and while Oregon has fewer wolves than the remainder of states which encompass the NRM DPS, USFWS indicated in its April 2, 2009 Final Rule (FR/Vol. 74, No. 62) that the NRM DPS was “By all measures . . . extremely demographically and genetically diverse, will remain so, and is completely biologically recovered.”

The gray wolf is highly territorial, occupying home ranges from approximately 40 to 400 sq. mi, depending on habitat and prey base available. Gray wolf dispersal is characteristically done by 2 to 3-year-old males and females because of social strife within the pack, size of prey, prey density, or to find a mate and establish a territory. Average dispersal distances from natal home ranges are 68 miles for males and 47 miles for females with some dispersal exceeding 360 miles (Boyd et al. 1995). From the western population, gray wolves have dispersed into Washington, Oregon, Utah, and 30 miles west of Denver, Colorado, as well as into the Canadian Provinces of British Columbia and Alberta. The longest documented dispersal distance is 504 miles from Montana into Canada (Boyd et. al. 1995). In addition, a number of dispersals have been documented from the southern provinces of Canada into the United States. As the wolf population increases, an increase in the number and dispersal of wolves into new unoccupied areas may increase the potential for gray wolf encounters with APHIS-WS IWDM activities and related tools.

<u>Effects of the proposed action and individual management methods.</u>

The primary potential for program effects on wolves that may be in California would be associated with accidental injury or death of a non-target wolf due to efforts to control predation on livestock by predators, specifically coyotes, mountain lion, and black bear. To a much lesser extent due to the very low and infrequent level of work proposed, similar effects may occur when the program captures these species to protect human safety and health, or potentially when working to protect the Sierra Nevada bighorn sheep from predation effects. Beaver trapping may also have the potential to capture a wolf.

Managing predation on livestock involves some methods that may have the potential to affect wolves if wolves are present. On most ranches, or allotments, predator damage can occur whenever vulnerable livestock are present. Managing threats to human health and safety would be rare in locations where wolves are likely to be found. Most work occurs at campgrounds or areas where wildlife has become habituated to humans. Predator damage management methods that may be used by the California APHIS-WS program that are potentially harmful to wolves include leg-hold traps, neck and foot-snares, and gas cartridges. Other methods used by the program to control predation on livestock, protect human safety and health, property and natural resources do not have the potential to harm wolves. Traps used to control beaver damage may also pose a potential risk to gray wolves.

Gas Cartridges

The APHIS-WS program specifically formulates gas cartridges for use in predator dens. These cartridges are hand placed in the active burrow or den of the target animal, the fuse is lighted, and the entrance is tightly sealed with soil. The burning cartridge causes death from a combination of oxygen depletion and carbon monoxide poisoning. Primary hazards to non-target species are negligible because the cartridges are only used on dens known to be actively used by the target species. There are no secondary or subsequent hazards associated with gas cartridges.

Leg-hold traps

Leg-hold traps may be used for bobcat (*Felis rufus*), coyote (*Canis latrans*), and cougar (*Felis concolor*) to protect human safety or endangered bighorn sheep. Foot snares are set for black (*Ursus americanus*) bears and coyotes. Capture devices, such as these, used in restraining sets must incorporate pan-tension devices, if appropriate, to prevent or reduce the capture of non-target animals, unless such use would preclude capture of the intended target animals. The leg-hold trap can be set under a wide variety of conditions but can be difficult to keep in operation during rain, snow, or freezing weather. When placed without baits in the travel lanes of target animals, leg-hold traps are known as “trail sets.” More frequently, traps are placed as “baited sets,” meaning that they are used with bait consisting of the animal's preferred food or some other lure, such as fetid meat, urine, or musk, to attract the animal. In some situations a “draw station,” such as a carcass or large piece of meat, is used to attract target animals. In this approach, one to several traps are placed in the vicinity of the draw station. APHIS-WS program policy prohibits placement of traps closer than 30 feet to the draw station. This provides ¬protection to scavenging birds.

Before leg-hold traps are employed, their limitations must be considered. Injury to target and non-target animals, including livestock, may occur. Weather and the skill of the user will often determine the success or failure of the leg-hold trap in preventing or stopping wildlife damage. Various tension devices can be used to prevent animals smaller than target animals from springing the trap. Effective trap placement also contributes to trap selectivity; however, livestock and non-target animals may still be captured. These traps usually permit the release of non-target animals.

Snares

Snares may be employed as both lethal or live capture devices depending on how and where they are set. Snares set to capture an animal by the neck are usually lethal but stops can be applied to the cable to make the snare a live capture device. Snares positioned to capture the animal around the body can be useful live capture devices. Also, most snares incorporate a breakaway feature to release non-target wildlife and livestock. These snares can be effectively used wherever a target animal moves through a restricted lane of travel (i.e., “crawls” under fences, trails through vegetation, or den entrances). When an animal moves forward into the loop formed by the cable, the noose tightens and the animal is held.

The foot snare is a spring powered non-lethal device, activated when an animal places its foot on the trigger. Foot snares can be used effectively to capture most mammal species but are most frequently used to capture coyotes and bobcats. Foot snares are also used effectively to capture large predators such as bears. They have limited application but are effective when used under proper conditions. They are much lighter and easier to use than leg-hold traps and are not generally affected by inclement weather.

In some situations using snares to capture wildlife is impractical due to the behavior or morphology of the animal, or the location of many wildlife conflicts. Snares must be set in locations where the likelihood of capturing non-target animals is minimized.

Shooting

Shooting is used selectively for target species but may be relatively expensive because of the staff hours sometimes required. Shooting is frequently performed in conjunction with calling particular predators such as coyotes, bobcats, and fox. Trap wise coyotes are often vulnerable to calling. Shooting is limited to locations where it is legal and safe to discharge firearms. Shooting may be ineffective for controlling damage by some species and may actually be detrimental to control efforts. Aerial Shooting, or shooting from aircraft, is used as a coyote damage control method. Aerial shooting is highly selective and can be used for immediate control where livestock losses are severe if weather, terrain, and cover conditions are favorable.

Beaver Traps

California APHIS-WS traps beaver to assist irrigation districts, home owners, county road maintenance to preventing flooding of roads, agricultural lands, and other properties. Three types of beaver traps are used routinely by APHIS-WS personnel: snares, body-grip (e.g., Conibear) traps. Beaver traps are set under water. The Conibear consists of a pair of rectangular wire frames that close like scissors when triggered, killing the captured animal with a quick body blow.

Minimization measures

WS specialists use a professional program decision model (Slate et al. 1992) when developing strategies to address all requests for assistance with wildlife damage. Consideration is given to a variety of factors including the presence of and potential risk to non-target species including T&E species. APHIS-WS specialists are specially trained in techniques to recognize and minimize risks to non-target species including T&E species. APHIS-WS will continue to keep its specialists apprised of the status of wolves in California and provide them with information about confirmed wolf presence.

Oregon APHIS-WS has followed reasonable and prudent measures to minimize incidental take of the gray wolf in the past as in other states. For the purpose of this consultation, "occupied federally protected wolf territory" is defined as follows: Area of confirmed presence of resident breeding packs or pairs of wolves or area consistently used by > resident wolf or wolves over a period of at least 1 month. Confirmation of wolf presence is to be made or corroborated by the U.S. Fish and Wildlife Service or the California Department of Fish and Game. Exact delineation of area will be described by (1) 5-mile radius around all locations of wolves and wolf sign confirmed as described above (non-radio monitored), (2) 5-mile radius around radio locations of resident wolves when < 20 radio locations are available (for radio monitored wolves only), or (3) 3-mile radius around the convex polygon developed from >20 radio locations of a pack, pair, or single wolf taken over a period of > 6 months (for radio monitored wolves). This definition is consistent with the definition used by the USFWS for the Yellowstone and central Idaho experimental population areas.

When the presence of a wolf is confirmed by the USFWS or CDFG, APHIS-WS will rely on information on the wolf's location from one or both agencies, or other agencies and tribes as they may be involved with wolf monitoring in order to take measures to preclude injuring or killing a wolf while conducting predator management operations. The following measures will be used for the activities that may affect wolves in areas occupied by gray wolves. This list includes conditions established in the USFWS Biological Opinion on the APHIS-WS program (1992).

1. All leg-hold traps larger than 3N shall be solidly staked and checked at least once a day in areas know to be occupied by gray wolves.

2. All #3 Soft-Catch traps will be staked solidly, so that an adult wolf would be expected to pull free form these traps. If soil conditions were such that there was some question about whether the stake might be pulled out of the ground by an adult wolf, then an extended chain with drag should also be attached to the trap

3. Non-breakaway neck snares shall not be used in areas known to be occupied by federally protected gray wolves unless wolves are the target species. While there is no proposal at this time to target wolves, potentially, APHIS-WS may be requested to assist with live or lethal wolf capture for the purposes of fitting radio collars, relocating a wolf, or managing livestock or human safety threats. Wolves would not be targeted without further consultation with the USFWS.

4. Number 3N or smaller traps may pose a threat to juvenile wolves and therefore should not be used in proximity to occupied dens and rendezvous sites. Upon documentation of wolf pups in the vicinity of control areas, the use of leg-hold traps shall be in coordination with the Fish and Wildlife Service.

5. The Service's Fish and Wildlife Office and California Department of Fish and Game, shall be notified as soon as possible of the finding of any dead or injured gray wolf according 2012

coordination plan. Cause of death, injury, or illness, if known, also shall be conveyed to those offices. APHIS-WS personnel will participate in interagency wolf monitoring programs.

6. Wildlife Services is currently a member of interagency wolf coordination team; so we are well informed of evolving policy and procedures involving wolves as promulgated by State and Federal wildlife management agencies.

7. Cumulative effects are those effects of future State, Tribal, local or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

8. The following future State, Tribal, local or private activities may affect the gray wolf and result in direct mortality: habitat loss or reduction of habitat suitability; and human induced mortality from vehicle strikes and poaching. Therefore, when and if wolves continue to disperse into California and become established, there may be an increase in the likelihood of effects on wolves.

Effects on wolves

We have reviewed the level of non-target APHIS-WS program non-target take of wolves in other western states where wolf populations are relatively high. The level of APHIS-WS non-target gray wolf take per year in both the NRM DPS, and Great Lakes areas totals 2.1 wolves per year on average since 2005. Wolves were captured by neck snare; leghold trap, M-44 (not used in California) and leghold trap set for beaver. The estimate for the total Northern Rocky Mountain gray wolf population in 2009 was 1,706 wolves in 242 packs and 115 breeding pairs (USFWS et al. 2010). The Wisconsin gray wolf population was estimated at between 626 to 664 in 2009 (WDNR 2009). APHIS-WS program operations in those states are similar to the California APHIS-WS program except that the CA program does not use M-44s and leg-hold traps are not allowed for use in protecting livestock. With fewer tools that may affect wolves and the number of wolves that may be in California both now and in the near term, the potential program risk to wolves in California is exceedingly low.

CONCLUSION

Based on the low level use of tools in California that may affect gray wolves, the data on non-target program effects in other states with wolf populations, the number of wolves in California, coordination with USFWS and CDFG on wolf presence, and the minimization measures described herein, the California APHIS-WS program is not likely to adversely affect the gray wolf. When and if wolves become established in California, if WS is requested to assist with intentional wolf capture, or if there are other substantive changes to the program, WS will reinitiate consultation with the USFWS to review the new information.

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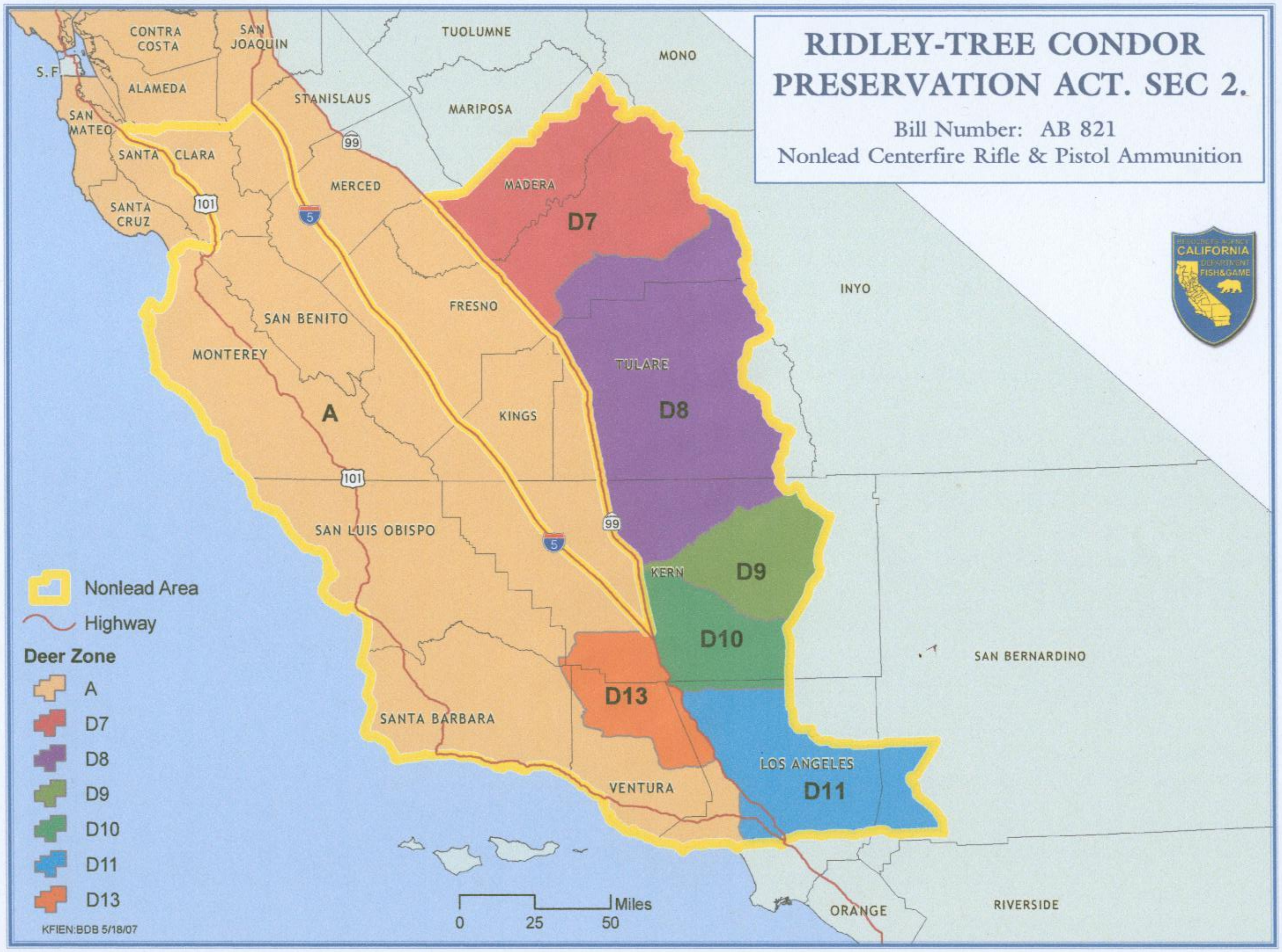
Slate, D. A., R. Owens, G. Connolly, and G. Simmons. 1992. Decision making for wildlife damage management. Trans. N. A. Wildl. Nat. Res. Conf 57:51-62.

U.S. Fish and Wildlife Service(USFWS), Nez Perce Tribe, National Park Service, Montana Fish, Wildlife & Parks, Blackfeet Nation, Confederated Salish and Kootenai Tribes, Idaho Fish and Game, and USDA Wildlife Services. 2010. Rocky Mountain Wolf Recovery 2009 Interagency Annual Report. C.A. Sime and E. E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana. 59601.

Wisconsin Department of Natural Resources (WDNR). 2009. Gray wolf (Canis lupus). http://dnr.wi.gov/org/land/er/mammals/wolf/wolf_facts.htm. Last revised Oct. 2, 2009. Downloaded on Nov. 23, 2010.

ATTACHMENT 1


RIDLEY-TREE CONDOR
PRESERVATION ACT. SEC 2.
Bill Number: AB 821
Nonlead Centerfire Rifle & Pistol Ammunition
CALIFORNIA
FISH&GAME
CONTRA COSTA
SAN JOAQUIN
S.F.
ALAMEDA
SAN MATEO
SANTA CLARA
SANTA CRUZ
STANISLAUS
TUOLUMNE
MARIPOSA
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SAN BENITO
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SAN BERNARDINO
SANTA BARBARA
LOS ANGELES
D11
VENTURA
ORANGE
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Nonlead Area
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KFIEN:BDB 5/18/07

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Southwest Region
2800 Cottage Way, Suite W-2606
Sacramento, California 95825

In Response Reply To:
FWS/R8/AES/08E00000-2014-I-0011

APR 15 2014

Dennis Orthmeyer
State Director, California Office
Animal and Plant Health Inspection Service, Wildlife Services
U.S. Department of Agriculture
3419A Arden Way
Sacramento, California 95825

Subject: Informal consultation on USDA APHIS California Wildlife Services Program Part II

Dear Mr. Orthmeyer:

On May 15, 2012, we received your letter requesting initiation of informal consultation on the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) California Wildlife Services (WS) Program Part II, in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Part II of your program addresses integrated wildlife damage management to protect livestock, property, human health and safety, and natural resources. You determined that the proposed actions are not likely to adversely affect the federally endangered California condor (*Gymnogyps californianus*, condor) and gray wolf (*Canis lupus*, wolf), or the federally threatened desert tortoise (*Gopherus agassazii*, tortoise) and requested our concurrence with that determination. You have also determined that the proposed program is likely to adversely affect the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*, SJKF), and have separately requested formal consultation to address adverse effects to the SJKF. Effects to SJKF will be addressed in a biological opinion which will be transmitted separately.

Our analysis is based on information provided in the *Biological Assessment, USDA Animal and Plant Health Inspection Service, California Wildlife Services Program Part II: Integrated Wildlife Damage Management to Protect Livestock, Property, Human Health and Safety, and Natural Resources* (BA), dated May 9, 2012; additional information about your program from an earlier version of the BA dated February 7, 2007; and correspondence, notes and information compiled during the course of our consultation on the subject project. This letter supplements our concurrence on this program dated May 8, 2007, which did not include the California condor, gray wolf, or the desert tortoise. This information and other references cited in this letter constitute the best available scientific information on the status and biology of the species considered.

Proposed Action

The APHIS-WS program provides assistance to protect livestock, crops, human health and safety and property from wildlife damage. Assistance may include direct control of problem species causing damage. APHIS-WS's control actions are targeted at coyotes, black bears, mountain lions, bobcats, red fox, gray fox, beavers, muskrats, raccoons, striped and spotted skunks, opossums, weasels, badgers, marmots, feral pigs, feral dogs, feral cats, ravens, blackbirds, crows, starlings, gulls, raptors, pigeons, waterfowl, and other species that cause damage.

APHIS-WS uses the following wildlife damage management techniques in the State of California:

a. Nonlethal methods: exclusion, harassment (pyrotechnics, propane cannons, vehicle harassment, spotlighting harassment, effegies, dog harassment, bioacoustics), soft catch leghold and foothold traps, cage traps, leg snares, alpha-chloralose, raptor traps, trail and decoy dogs
b. Lethal non-chemical methods: shooting, neck snares, conibear traps, aerial shooting, nest and egg removal
c. Lethal chemical methods: DRC-1339 avicide, gas cartridge, sodium pentobarbital, CO^2, and the M-44 device[1].

California Condor

APHIS-WS has determined that the use of M-44 devices, shooting (both ground-based and aerial), and the use of leg-hold traps and snares may affect, but are not likely to adversely affect the condor in California. We provide our concurrence based on the following reasoning:

- M-44 devices are only authorized for use on Tribal lands in California. Since there are minimal Tribal lands within the current range of the condor in California[2] and there is only a limited potential for a condor to activate an M-44 device, we have determined that the potential for condors to be adversely affected by APHIS-WS current use of the M-44 device in California is discountable.
- Shooting activities will be compliant with State restrictions on the use of lead shot and ammunition, which will avoid the potential for condors to ingest lead. Any animals that are shot with lead ammunition will be disposed of to a place inaccessible to condors[3]. Use of aircraft during control activities involving shooting will ensure that aircraft follow

[1] M-44 devices are not currently authorized for use in California except on Tribal lands. Our analysis only addresses use of the M-44 device on Tribal lands and does not address a more widespread potential future use in California.
[2] In the future, if condors are released onto tribal lands, further coordination may be necessary to address any potential effects.
[3] California Assembly Bill No. 711 was passed in October 2013 and bans the use of lead ammunition for hunting wildlife. Implementation will be phased in to be complete no later than June 30, 2019.

standard operation procedures that will avoid airstrikes of condors. Therefore, shooting activities are unlikely to adversely affect condors.

- Padded leghold traps will be used primarily in urban areas for the protection of health and human safety. These traps will not be baited with a carcass which could attract condors. It is extremely unlikely that a condor will come into contact with one of these traps; therefore, any effects are discountable.
- Snares are used to ensnare target animals around the neck. Every attempt will be made to set neck snares along fence lines. However, if a snare is used away from a fence, it will not be set in association with a carcass. During past use of snares, no condor has been captured in an APHIS-WS snare. We do not anticipate that condors will become ensnared in these devices because no carcass which could attract condors will be used. Therefore, the risk of a condor being ensnared is discountable.

Desert Tortoise

APHIS-WS has determined that the use of vehicles in association with control efforts, neck snares, cage traps, and collarum devices snares may affect, but are not likely to adversely affect, the desert tortoise in California. We provide our concurrence based on the following reasoning:

- APHIS-WS vehicles will follow measures to completely avoid potential injury or mortality of tortoise related to vehicle activities. Therefore, vehicle activities are unlikely to adversely affect tortoise.
- Neck snares will primarily be used during periods when tortoise are typically inactive, will be set at a height where tortoise are unlikely to be ensnared, and will be used very infrequently in tortoise habitat. During past use of snares in tortoise habitat, no tortoise has been captured in an APHIS-WS snare. Therefore, we do not anticipate that tortoises will be caught in snares or the use of snares will otherwise adversely affect tortoise.
- Cage traps are likely to be used very infrequently in tortoise habitat and it is unlikely that tortoise would be attracted to or enter into a cage trap. If tortoise do occasionally wander into an open trap, it is unlikely that tortoise would trigger the trip mechanism due to the lighter weight of tortoise relative to the target species. During past use of cage traps in tortoise habitat, no tortoise has been captured in an APHIS-WS cage trap. Therefore, we do not anticipate that tortoises will be caught in cage traps or the use of cage traps will otherwise adversely affect tortoise.
- Because tortoises are not likely to be attracted to collarum devices or activate the mechanism that triggers these devices, it is unlikely that tortoise would be captured within collarum devices. Therefore, we do not anticipate that tortoises will be caught in collarum devices or the use of collarum devices will otherwise adversely affect tortoise.

Gray Wolf

APHIS-WS has determined that the use of gas cartridges, leghold traps, neck and foot snares, beaver traps, and shooting may affect, but are not likely to adversely affect, the gray wolf in California. We provide our concurrence based on the following reasoning:

- Confirmation of wolf presence is to be made or corroborated by the U.S. Fish and Wildlife Service (Service) and/or the California Department of Fish and Wildlife (CDFW). APHIS-WS personnel will participate in interagency wolf monitoring programs and will keep its specialists apprised of the status of wolves in California and provide them with the locations of confirmed wolf presence.
- With the passage of Proposition 4 in 1998, all steel jawed leg-hold traps were banned for use in the state of California. Therefore, APHIS-WS will not use these types of traps in California, eliminating this threat to the gray wolf.
- When the presence of a wolf is confirmed by the Service or CDFW, APHIS-WS will rely on information on the wolf's location from one or both agencies, or other agencies and tribes as they may be involved with wolf monitoring in order to take measures to preclude injuring or killing a wolf while conducting predator management operations. The following measures will be used for the activities that may affect wolves in areas occupied by gray wolves:

    - All #3 Soft-Catch traps, which are used in public safety and for the protection of endangered species (primarily Sierra Nevada bighorn sheep, which occurs outside the current range of the gray wolf) will be staked solidly, so that an adult wolf would be expected to pull free from these traps. If soil conditions were such that there was some question about whether the stake might be pulled out of the ground by an adult wolf, then an extended chain with drag will be attached to the trap.
    - Breakaway neck and foot snares can be used in areas known to be occupied by gray wolves. These types of snares are not expected to injure or harm the gray wolves. Non-breakaway neck snares will not be used in areas known to be occupied by gray wolves unless wolves are the target species. While there is no proposal at this time to target wolves, potentially, APHIS-WS may be requested to assist with live or lethal wolf capture for the purposes of fitting radio collars, relocating a wolf, or managing livestock or human safety threats. Wolves would not be targeted without further consultation with the Service.
    - Conibear traps and non-breakaway snares set for beaver shall be set underwater in areas known to be occupied by federally protected gray wolves. We do not expect that gray wolves will come into contact with these devices because they will be underwater.
    - The Service's Pacific Southwest Regional Office and CDFW shall be notified as soon as possible of the finding of any dead or injured gray wolf according to the 2012 coordination plan. Cause of death, injury, or illness, if known, also shall be conveyed to those offices.

Thank you for the efforts by you and your staff to work with the Service on this consultation. If you have additional questions or concerns, feel free to contact Jana Affonso of my staff at 916-414-6593.

Sincerely,

For: Michael Fris
Assistant Regional Director