

Introduction:

The Salmon Protection and Watershed Network (Permittee) will improve rearing habitat for coho salmon by installing 18 anchored Large Woody Material (LWM) structures consisting of large key pieces, multiple logs and rootwads, small trees and ample brush along Green Valley Creek in Sonoma County to Increase LWM frequency to optimal conditions which is greater than 6 key LWM pieces per 100 meters.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual, Volume I, Part VII*.

Objectives:

- 1) This project will install 18 anchored LWM structures consisting of large key pieces, multiple logs and rootwads, small trees and ample brush to make large, hefty structures that interact significantly with flows that will trap gravels, backwater flows, and force scour pools. This will occur in strategic locations selected for aggrading the stream channel of upper Green Valley Creek. This project has been designed and engineered by Geomorph Designs - Civil Engineering and Geomorphology - which has determined optimal placement of the structures to achieve these objectives. Boulder calculations and intermediate design plans have been prepared.
- 2) The principal goal of the project is to aggrade the stream channel by utilizing placement of LWM to retain coarse bedload. Secondary goals of the project aim to provide ample range of complex habitat opportunities for salmonid rearing and Permitteeing with additional benefits to sediment, sorting, metering, and attenuation. With the goal of aggrading the stream bed, this project also aims to create closer connection between the channel and inset floodplain where off-channel habitat can be made available to rearing juvenile coho and steelhead.
- 3) The project objectives are principally aimed to aggrade the stream channel by having LWM interacting significantly with flows, which trap gravel and coarse bedload, and to raise water surfaces to connect channel to the inset floodplain. To help implement these objectives, the LWM structures will primarily be channel-spanning and constricting. These are designed with 2-4 large key members (35 feet long x 18 inches diameter), along with other logs and root wads (25 feet long x 18 inches diameter), with small trees and brush jammed through to add roughness, bulk, and mass to the structures to help take up a great deal of surface area, and add biological value and complexity. The locations of the proposed LWM structures are placed primarily in locations where narrow channel corridors exist and can be choked with large wood, and where backwatering can aggrade the channel onto the inset floodplains where off-channel habitat can be created. Key logs used will be 1.5x bankul width. These

LWM structures have been engineered and anchor boulder calculations have been compiled by a licensed Civil Engineer. In many places, 2-ton boulders have been substituted for 1-ton boulders to reduce the total number of boulders throughout the creek. Site access will be down from the top of banks on both sides of the creek. No de-watering will occur and no fish location is required. Access will be from the banks by positioning the heavy equipment on gravel bars and low banks. Pacific Lamprey larvae, or ammocoetes, may reside in Green Valley Creek where the channel is relatively deep, low gradient, low velocity, and the riparian canopy is open. Rearing ammocoetes burrow into fine sediments mixed with organic matter and detritus during rearing periods. The Project design of placing LWM will incorporate location placement and orientation that promotes sediment deposition and sorting that may be effective at developing habitat attractive to rearing Pacific Lamprey ammocoetes. The protocols and procedures that will be used to complete the objectives of the project include following the CDFW Stream Habitat Restoration Manual for each restoration element. Existing case studies and literature will be referenced for providing supplemental information on habitat restoration elements and additional techniques found to be effective. Lastly, following practices consistent with the implementation of former projects on Green Valley Creek below this project reach will help guide LWM placement, orientation, anchoring, access, and staging.

The total habitat metric for the project is based on the NOAA Central California Coast Coho Recovery Plan that calls for increased placement of LWM throughout the watershed. For this project, located in the headwaters of Green Valley Creek the habitat metric is >6 key pieces of wood per 100 meters. For this project, a total of 18 structures consisting of multiple key pieces (35 feet long x 18 inches diameter) of wood will be used for each structure. The average bankfull width of the creek within the project area is 25 feet with an average gradient of 0.7%.

Project Description:

Location:

The project reach is located on upper Green Valley Creek. The downstream end of the project is 0.4 miles downstream of the confluence with Harrison Creek at Green Valley Road, or 3.5 river miles upstream from the confluence with Atascadero Creek. The upstream end of the project is 0.2 miles downstream from the confluence of Harrington Creek. Project coordinates are: 38.445419° north, -122.919152° west.

Project Set Up:

Project Administration: Permittee will direct project implementation, submit reporting, manage subcontractor, oversee budgets and invoices, and oversee project compliance and construction. Permittee will retain a bookkeeper

(subcontractor) for the efforts needed for invoicing, payment, and budget recording. Permittee personnel on this task include Project Supervisor, Project Manager, and Project Associate.

Permitting: Permittee will obtain a California Department of Fish and Wildlife (CDFW) Lake and Streambed Alteration Agreement (1600) and will also contract with a Resource Specialists Contractor (subcontractor) to conduct archeology and paleontology surveys required for Fisheries Restoration Grants Program (FRGP) programmatic California Environmental Quality Act (CEQA) coverage. These professional subconsultants have not been selected yet but will be required to demonstrate that they have performed these services for previous FRGP- funded projects and show that are familiar with the required protocols to be compliant with CEQA, state and federal opinions and permits. Permittee will conduct the Botanical Survey and will prepare reporting consistent with CEQA standards. Permittee personnel on this task include the Project Manager, Project Associate, and Intern I and Intern II.

Pre-Construction Services: Permittee will establish contracts with subcontractors, including Geomorph Design engineering. Permittee will lead the pre-construction services which will include site visits with the Contractor, Landowner and Engineer, coordinate Resource-Specialist surveys, submit reporting, and initiate construction. Permittee will perform sensitive species surveys for California red-legged frog and nesting birds. Permittee will conduct an environmental training for workers on special status species and procedures to follow a species is found, and; other environmental BMPs. Permittee staff and Interns will be present onsite for initial ground disturbance, mobilization, and construction. Project Personnel on this task include Project Supervisor, Project Manager, Project Associate, Project Associate II, Intern I and Intern II. The contractor will include Dragonfly Stream Enhancement (DSE) Equipment Operator and Skilled Laborer (subcontractor). The Engineer, Geomorph Designs will be present during construction periods to assess progress and check construction methods.

Project Construction: Permittee will oversee site control and compliance. Dragonfly Stream Enhancement (DSE) will construct the LWM structures according to the Design Plans prepared by Geomorph Designs. Dragonfly Stream Enhancement will set up mobilization, site access and staging, equipment and supply delivery coordination, LWM structure installation, anchoring, and demobilization. Permittee will support construction with hand labor. Permittee will assist with LWM placement, slash and brush sourcing, and jamming, site maintenance, and overall assistance. Permittee will implement ground repair, which will include direct seeding erosion blanket. DSE personnel includes Equipment Operator and Skilled Laborer. Permittee personnel on this task include the Project Manager, Project Associate, Project Associate II, Intern I and Intern II. Geomorph Designs will also conduct and prepare As-Built surveys following implementation.

Erosion Control and Revegetation: Permittee personnel and Dragonfly Stream Enhancement (DSE) (subcontractor) will implement the erosion control, revegetation using the Erosion Control and Revegetation Supplies. This includes seeding, erosion control, planting, and plant protection cages. This task will be completed by the Permittee Project Supervisor, Project Manager, Project Associate, Project Foreman, Volunteer Interns I, II, and Volunteers, and DSE Equipment Operator and Skilled Laborer. Equipment used for this task include Erosion Control and Revegetation materials, Hand Tools Biological Field Vehicle, and use of the Intern Housing Facility. Mileage will also be billed to the task. Construction Management and Oversight: Permittee will coordinate weekly construction meetings, prepare reports for Permititor, be on-site biological monitoring, keep the project in compliance with permits, and oversee construction activities. Permittee staff include Project Supervisor, Project Manager, Project Associate, Intern I and Intern II.

Monitoring and Maintenance: Permittee and DSE will perform pre-and-post-construction monitoring to measure the function and results of the LWM structures. Permittee will prepare a draft monitoring plan, to be reviewed and approved by Permititor Grant Manager, and implement the monitoring plan following construction. Permittee and DSE will collect pre-project photo documentation of the sites. The monitoring plan will include but not limiting to: wood volume measurements, photographs, documentation of salmonid Permitteeing and rearing, and time-lapse camera footage of flood events. This will be led by Permittee Project Manager, Project Associate, Project Associate II, Volunteer Interns I, II, and Volunteers and supported by DSE Equipment Operator.

Materials:

The construction subcontractor is responsible for the rental of heavy machinery for installing the LWM structures. Equipment used may include excavator, front loader, dump truck.

Large wood material will be provided by the construction subcontractor. Large logs that meet design specifications may consist of Douglas fir or redwood logs and rootwads. LWM anchoring materials will be provided by the construction subcontractor. Ballast and anchoring materials may include rebar, all-thread, washers, nuts, and epoxy.

Two ton and 1 ton rock or boulders for ballasting the LWM structures will be provided by the construction subcontractor.

The Permittee will provide erosion control and revegetation supplies consisting of the following: erosion control fabric, fencing, seeds, willows, straw, and wattles.

The Permittee will provide hand tools, including shovels, digging bars, loppers, and sledgehammers.

Permittee will purchase waders to aide in conducting instream project inspections.

Permittee will rent a field vehicle for transportation of staff and materials to and from the construction site. In addition to the rental fees permittee will see reimbursement for milage to cover vehicle operating expenses.

Permittee will provide Intern housing (lodging) at a rate of \$275 per week for 12 weeks. This expense provides support for interns by providing short-term housing for intern volunteers.

Tasks:

Task 1: Project Administration

Permittee will direct project implementation, submit reporting, manage subcontractor, oversee budgets and invoices, and oversee project compliance and construction. Permittee will retain a bookkeeper (subcontractor) for the efforts needed for invoicing, payment, and budget recording. Permittee personnel on this task include Project Supervisor, Project Manager, and Project Associate.

Task 1 Deliverables

- 1) Quarterly Progress Reports and Invoices
- 2) Annual Monitoring Reports
- 3) Draft Final Report
- 4) Final Report

Task 1 Deliverables Timeline

05/01/2022

03/31/2025

Task 2: Permitting

Permittee will obtain a California Department of Fish and Wildlife (CDFW) Lake and Streambed Alteration Agreement (1600) and will also contract with a Resource Specialists Contractor (subcontractor) to conduct archeology and paleontology surveys required for Fisheries Restoration Grants Program (FRGP) programmatic California Environmental Quality Act (CEQA) coverage. These professional subconsultants have not been selected yet but will be required to demonstrate that they have performed these services for previous FRGP- funded projects and show that are familiar with the required protocols to be compliant with CEQA, state and federal opinions and permits. Permittee will conduct the Botanical Survey and will prepare reporting consistent with CEQA standards. Permittee personnel on this task include the Project Manager, Project Associate, and Intern I and Intern II.

Task 2 Deliverables

- 1) CDFW 1600 LAA Permit

2) Archeology/Cultural Resources Report

3) Botanical Report

Task 2 Deliverables Timeline

05/15/2022

08/01/2022

Task 3: Pre-Construction Services

Pre-Construction Services: Permittee will establish contracts with subcontractors, including Geomorph Design engineering. Permittee will lead the pre-construction services which will include site visits with the Contractor, Landowner and Engineer, coordinate Resource-Specialist surveys, submit reporting, and initiate construction. Permittee will perform sensitive species surveys for California red-legged frog and nesting birds. Permittee will conduct an environmental training for workers on special status species and procedures to follow a species is found, and other environmental BMPs. Permittee staff and Interns will be present onsite for initial ground disturbance, mobilization, and construction. Project Personnel on this task include Project Supervisor, Project Manager, Project Associate, Project Associate II, Intern I and Intern II. The contractor will include Dragonfly Stream Enhancement (DSE) Equipment Operator and Skilled Laborer (subcontractor). The Engineer, Geomorph Designs will be present during construction periods to assess progress and check construction methods.

Task 3 Deliverables

1) Copies of signed contracts with Contractors

2) Sensitive Species Reports

3) Biological Training for Contractor

Task 3 Deliverables Timeline

06/01/2022

07/31/2022

Task 4 Project Construction

Project Construction: Permittee will oversee site control and compliance.

Dragonfly Stream Enhancement (DSE) will construct the LWM structures according to the Design Plans prepared by Geomorph Designs. Dragonfly

Stream Enhancement will set up mobilization, site access and staging, equipment and supply delivery coordination, LWM structure installation, anchoring, and demobilization. Permittee will support construction with hand

labor. Permittee will assist with LWM placement, slash and brush sourcing, and jamming, site maintenance, and overall assistance. Permittee will implement ground repair, which will include direct seeding erosion blanket. DSE personnel includes Equipment Operator and Skilled Laborer. Permittee personnel on this task include the Project Manager, Project Associate, Project Associate II, Intern I and Intern II. Geomorph Designs will also conduct and prepare As-Built surveys following implementation.

Task 4 Deliverables

1) Monthly Construction Monitoring Reports

Task 4 Deliverable Timeline

08/01/2022

10/15/2022

Task 5: Erosion Control and Revegetation

Permittee personnel and Dragonfly Stream Enhancement (DSE) (subcontractor) will implement the erosion control, revegetation using the Erosion Control and Revegetation Supplies. This includes seeding, erosion control, planting, and plant protection cages. This task will be completed by the Permittee Project Supervisor, Project Manager, Project Associate, Project Foreman, Volunteer Interns I, II, and Volunteers, and DSE Equipment Operator and Skilled Laborer. Equipment used for this task include Erosion Control and Revegetation materials, Hand Tools Biological Field Vehicle, and use of the Intern Housing Facility. Mileage will also be billed to the task.

Task 5 Deliverables

1) Post-construction progress report and site photos

Task 5 Deliverable Timeline

10/30/2022

05/01/2023

Task 6 Construction Management and Oversight

Construction Management and Oversight: Permittee will coordinate weekly construction meetings, prepare reports for Permittor, be on-site biological monitoring, keep the project in compliance with permits, and oversee construction activities. Permittee staff include Project Supervisor, Project Manager, Project Associate, Intern I and Intern II.

Task 6 Deliverables

1) Post-project Permit Reports

Task 6 Deliverable Timeline

Task 7: Monitoring and Maintenance

Monitoring and Maintenance: Permittee and DSE will perform pre-and-post-construction monitoring to measure the function and results of the LWM structures. Permittee will prepare a draft monitoring plan, to be reviewed and approved by Permittor Grant Manager, and implement the monitoring plan following construction. Permittee and DSE will collect pre-project photo documentation of the sites. The monitoring plan will include but not limiting to wood volume measurements, photographs, documentation of salmonid spawning and rearing, and time-lapse camera footage of flood events. This will be led by Permittee Project Manager, Project Associate, Project Associate II, Volunteer Interns I, II, and Volunteers and supported by DSE Equipment Operator.

Task 7 Deliverables

- 1) Draft Project Monitoring Report
- 2) Project Effectiveness Monitoring Report

Task 7 Deliverables TimeLine

12/01/2022

12/31/2024

Schedule and Deliverables:

<u>Task</u>	<u>Description</u>	<u>Deliverables</u>	<u>Estimated Completion Dates</u>
Task 1	Project Administration	Quarterly Progress Reports and Invoices	No more frequent than monthly during the grant period.
		Annual Monitoring Reports	1 November 2022 1 November 2023 1 November 2024
		Draft Final Report	2 January 2025
		Final Report	28 February 2025
Task 2	Permitting	CDFW 1600 LAA Permit	31 July 2022
		Archeology and Cultural Resources Report	31 July 2022
		Botanical Report	31 July 2022
Task 3	Pre-Construction Services	Copies of signed contracts with Contractors	1 June 2022
		Sensitive Species Reports	31 July 2022
		Biological Training for Contractor	31 July 2022
Task 4	Project Construction	Monthly Construction Monitoring Reports	15 August 2022 15 September 2022 15 October 2022
Task 5	Erosion Control and Revegetation	Post-construction progress report and site photos	1 May 2023
Task 6	Construction Management and Oversight	Post-project Permit Reports	15 October 2022
Task 7	Monitoring and Maintenance	Draft Project Monitoring Report	1 December 2024
		Project Effectiveness Monitoring Report	31 December 2024

The anticipated construction season work window will be from July 1 through October 15.

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual projects start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the California Department of Fish & Wildlife Aquatic Invasive Species Decontamination Protocol.

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

The Grantee shall notify the Grantor Project Manager a minimum of five working days before the project site is de-watered and the stream flow diverted. The notification will provide a reasonable time for Grantor personnel to oversee the implementation of the water diversion plan and the safe removal and relocation of salmonids and other fish life from the project area. If the project requires dewatering of the site, and the relocation of salmonids, the Grantee will implement the following measures to minimize harm and mortality to listed salmonids:

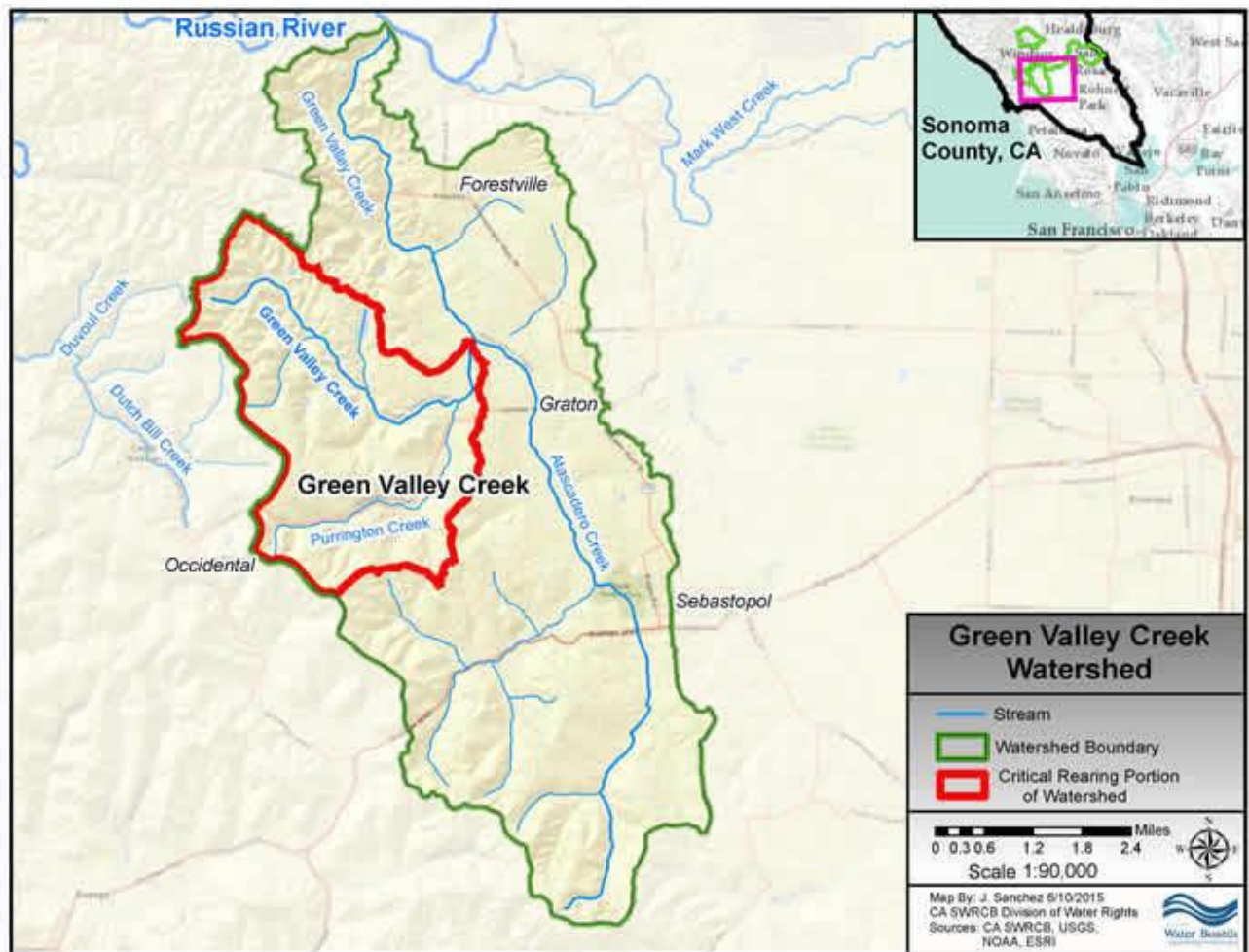
- a. Fish dewatering and relocation activities shall only occur between June 15 and October 31 of each year.
- b. Additional measures to minimize injury and mortality of salmonids during fish relocation and dewatering activities shall be implemented as described in Part IX, pages 52 and 53 of the *California Salmonid Stream Habitat Restoration Manual*.
- c. The Grantee shall minimize the amount of wetted stream channel dewatered at each individual project site to the fullest extent possible as approved by the

CDFW Grant Manager and pursuant to conditions in the USACE Regional General Permit and NMFS Biological Opinion.

- d. All electrofishing shall be performed by a qualified fisheries biologist and conducted according to the National Marine Fisheries Service, Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
- e. USFWS Approved fisheries biologists will provide fish relocation data via the Grantee to the CDFW Grant Manager on a form provided by CDFW.

Final structure design and placement will be determined by field consultation between the Grantee and the Grantor Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*.

Green Valley Creek Large Wood Loading | 2021

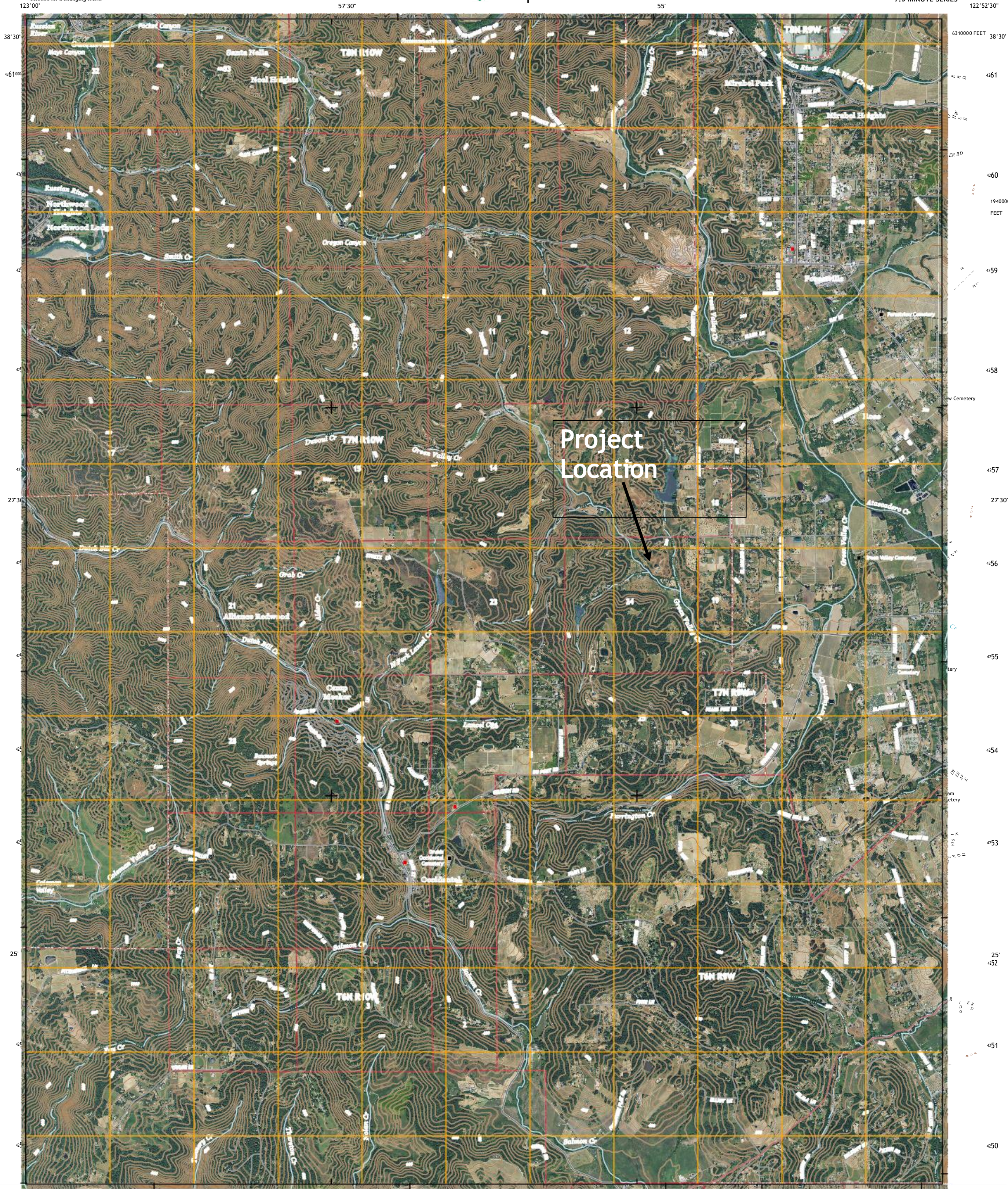




U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



CAMP MEEKER QUADRANGLE
CALIFORNIA-SONOMA CO.
7.5-MINUTE SERIES



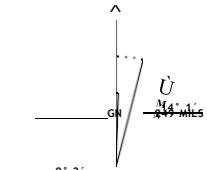
1900000 FEET
38° 22' 30" 123° 00' 57° 30' 55° 122° 52' 30" 6310000 FEET 38° 30' 4261 4260 1940000 FEET 4259 4258 4257 27° 30' 4256 4255 4254 4253 25° 4252 4251 4250

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83), Projection and
World Geodetic System of 1984 (WGS84).

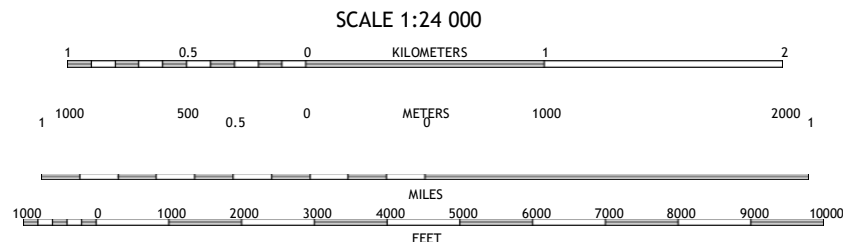
1,000-meter grid: Universal Transverse Mercator, Zone 10S
10,000-meter grid: Universal Transverse Mercator, Zone 10S

This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NAIP, May 2012
Roads.....HERE, ©2013 - 2014
Names.....GNS, 2015
Hydrography.....National Hydrography Dataset, 2012
Contours.....National Elevation Dataset, 1999
Boundaries.....Multiple sources; see metadata file 1972 - 2015
Public Land Survey System.....BLM, 2011



U.S. National Grid
100,000-m Square ID
EH
Grid Zone Designation
10S



CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18



QUADRANGLE LOCATION

ROAD CLASSIFICATION	
Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
	State Route

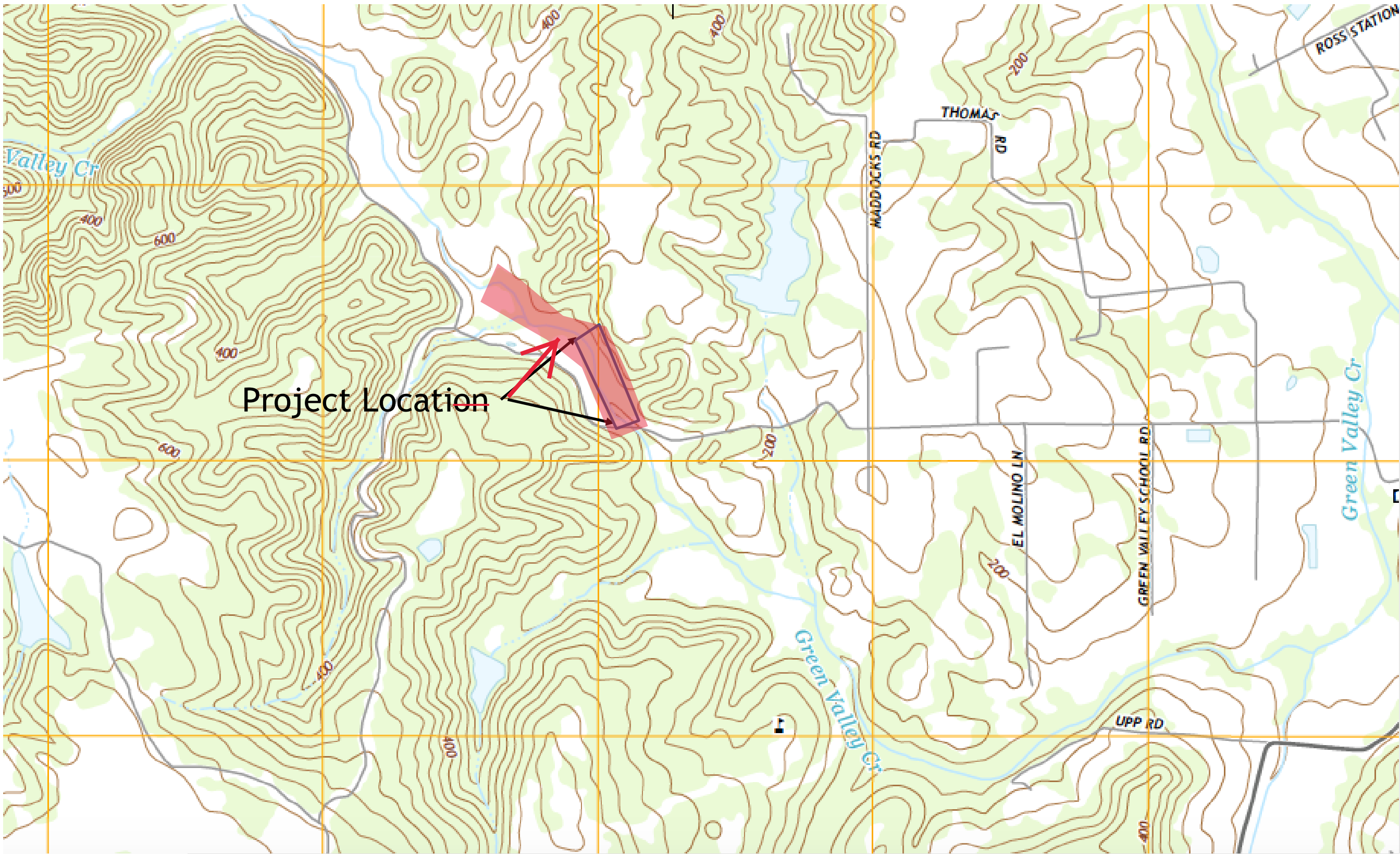
1	2	3
4	5	6
7	8	9

1 Cazadero
2 Guerneville
3 Healdsburg
4 Duncans Mills
5 Sebastopol
6 Bodega Head
7 Valley Ford
8 Two Rock

CAMP MEEKER, CA
2015

*7643016355896
NSN 7643016355896
NSA REF NO. USGS 244693

Green Valley Creek Large Wood Loading Project





Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad< IS (Camp Meeker (3812248) OR Sebastopol (3812247) OR Two Rock (3812237) OR Valley Ford (3812238) OR Bodega Head (3812331) OR Duncans Mills (3812341) OR Cazadero (3812351) OR Guerneville (3812258) OR Healdsburg (3812257))

Possible species within the Camp Meeker and surrounding quads for 1725987 - Green Valley Creek Large Wood Loading, Sonoma County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Abronia umbellata</i> var. <i>breviflora</i> pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
<i>Agelaius tricolor</i> tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
<i>Agrostis blasdalei</i> Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
<i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion	PMLIL021R1	None	None	G5T2	S2	1B.2
<i>Alopecurus aequalis</i> var. <i>sonomensis</i> Sonoma alopecurus	PMPOA07012	Endangered	None	G5T1	S1	1B.1
<i>Ambystoma californiense</i> pop. 3 California tiger salamander - Sonoma County DPS	AAAAA01183	Endangered	Threatened	G2G3	S2	WL
<i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
<i>Amsinckia lunaris</i> bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
<i>Andrena blennospermatis</i> Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
<i>Anodonta californiensis</i> California floater	IMBIV04220	None	None	G3Q	S2?	
<i>Anodonta oregonensis</i> Oregon floater	IMBIV04110	None	None	G5Q	S2?	
<i>Antrozous pallidus</i> pallid bat	AMACC10010	None	None	G4	S3	SSC
<i>Arboremus pomo</i> Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
<i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i> Baker's manzanita	PDERI04221	None	Rare	G2T1	S1	1B.1
<i>Arctostaphylos bakeri</i> ssp. <i>sublaevis</i> The Cedars manzanita	PDERI04222	None	Rare	G2T2	S2	1B.2
<i>Arctostaphylos densiflora</i> Vine Hill manzanita	PDERI040C0	None	Endangered	G1	S1	1B.1
<i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> Rincon Ridge manzanita	PDERI041G4	None	None	G3T1	S1	1B.1
<i>Ardea alba</i> great egret	ABNGA04040	None	None	G5	S4	



Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Ardea herodias</i> great blue heron	ABNGA04010	None	None	G5	S4	
<i>Athene cunicularia</i> burrowing owl	ABNSB10010	None	None	G4	S3	SSC
<i>Blennosperma bakeri</i> Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1	1B.1
<i>Bombus caliginosus</i> obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
<i>Bombus occidentalis</i> western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
<i>Brodiaea leptandra</i> narrow-anthered brodiaea	PMLIL0C022	None	None	G3?	S3?	1B.2
<i>Calamagrostis crassiglumis</i> Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
<i>Callophrys mossii marinensis</i> Marin elfin butterfly	IILEPE2207	None	None	G4T1	S1	
<i>Calochortus raichei</i> The Cedars fairy-lantern	PMLIL0D1L0	None	None	G2	S2	1B.2
<i>Calystegia purpurata ssp. saxicola</i> coastal bluff morning-glory	PDCON040D2	None	None	G4T2T3	S2S3	1B.2
<i>Campanula californica</i> swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
<i>Carex comosa</i> bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
<i>Castilleja uliginosa</i> Pitkin Marsh paintbrush	PDSCR0D380	None	Endangered	GXQ	SX	1A
<i>Ceanothus confusus</i> Rincon Ridge ceanothus	PDRHA04220	None	None	G1	S1	1B.1
<i>Ceanothus foliosus var. vineatus</i> Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1
<i>Ceanothus purpureus</i> holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
<i>Centromadia parryi ssp. parryi</i> pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
<i>Cerorhinca monocerata</i> rhinoceros auklet	ABNNN11010	None	None	G5	S3	WL
<i>Charadrius nivosus nivosus</i> western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
<i>Chlorogalum pomeridianum var. minus</i> dwarf soaproot	PMLIL0G042	None	None	G5T3	S3	1B.2
<i>Chloropyron maritimum ssp. palustre</i> Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i> San Francisco Bay spineflower	PDPGN04081	None	None	G2T1	S1	1B.2
<i>Chorizanthe cuspidata</i> var. <i>villosa</i> woolly-headed spineflower	PDPGN04082	None	None	G2T2	S2	1B.2
<i>Chorizanthe valida</i> Sonoma spineflower	PDPGN040V0	Endangered	Endangered	G1	S1	1B.1
<i>Cirsium andrewsii</i> Franciscan thistle	PDAST2E050	None	None	G3	S3	1B.2
<i>Clarkia imbricata</i> Vine Hill clarkia	PDONA050K0	Endangered	Endangered	G1	S1	1B.1
<i>Coastal and Valley Freshwater Marsh</i> Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
<i>Coastal Brackish Marsh</i> Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
<i>Coastal Terrace Prairie</i> Coastal Terrace Prairie	CTT41100CA	None	None	G2	S2.1	
<i>Coccyzus americanus occidentalis</i> western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
<i>Coelus globosus</i> globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
<i>Cordylanthus tenuis</i> ssp. <i>capillaris</i> Pennell's bird's-beak	PDSCR0J0S2	Endangered	Rare	G4G5T1	S1	1B.2
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i> Peruvian dodder	PDCUS01111	None	None	G5T4?	SH	2B.2
<i>Cuscuta pacifica</i> var. <i>papillata</i> Mendocino dodder	PDCUS011A2	None	None	G5T1	S1	1B.2
<i>Cypseloides niger</i> black swift	ABNUA01010	None	None	G4	S2	SSC
<i>Danaus plexippus</i> pop. 1 monarch - California overwintering population	IILEPP2012	Candidate	None	G4T2T3	S2S3	
<i>Delphinium bakeri</i> Baker's larkspur	PDRAN0B050	Endangered	Endangered	G1	S1	1B.1
<i>Delphinium luteum</i> golden larkspur	PDRAN0B0Z0	Endangered	Rare	G1	S1	1B.1
<i>Dicamptodon ensatus</i> California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
<i>Dirca occidentalis</i> western leatherwood	PDTHY03010	None	None	G2	S2	1B.2
<i>Downingia pusilla</i> dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2



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<i>Dubiraphia giulianii</i> Giuliani's dubiraphian riffle beetle	IICOL5A020	None	None	G1G3	S1S3	
<i>Elanus leucurus</i> white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
<i>Emys marmorata</i> western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
<i>Erethizon dorsatum</i> North American porcupine	AMAFJ01010	None	None	G5	S3	
<i>Erigeron greenei</i> Greene's narrow-leaved daisy	PDAST3M5G0	None	None	G3	S3	1B.2
<i>Erigeron serpentinus</i> serpentine daisy	PDAST3M5M0	None	None	G2	S2	1B.3
<i>Eriogonum cedrorum</i> The Cedars buckwheat	PDPGN087A0	None	None	G1	S1	1B.3
<i>Erysimum concinnum</i> bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
<i>Eucyclogobius newberryi</i> tidewater goby	AFCQN04010	Endangered	None	G3	S3	
<i>Eumetopias jubatus</i> Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
<i>Fissidens pauperculus</i> minute pocket moss	NBMUS2W0U0	None	None	G3?	S2	1B.2
<i>Fratercula cirrhata</i> tufted puffin	ABNNN12010	None	None	G5	S1S2	SSC
<i>Fritillaria liliacea</i> fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
<i>Gilia capitata ssp. chamissonis</i> blue coast gilia	PDPLM040B3	None	None	G5T2	S2	1B.1
<i>Gilia capitata ssp. pacifica</i> Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
<i>Gilia capitata ssp. tomentosa</i> woolly-headed gilia	PDPLM040B9	None	None	G5T2	S2	1B.1
<i>Gilia millefoliata</i> dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
<i>Gonidea angulata</i> western ridged mussel	IMBIV19010	None	None	G3	S1S2	
<i>Hemizonia congesta ssp. congesta</i> congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
<i>Hesperervax sparsiflora var. brevifolia</i> short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
<i>Horkelia marinensis</i> Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2



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<i>Horkelia tenuiloba</i> thin-lobed horkelia	PDROS0W0E0	None	None	G2	S2	1B.2
<i>Hysteroecarpus traskii</i> <i>pomo</i> Russian River tule perch	AFCQK02011	None	None	G5T4	S4	SSC
<i>Kopsiopsis hookeri</i> small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3
<i>Lasiurus blossevillei</i> western red bat	AMACC05060	None	None	G4	S3	SSC
<i>Lasiurus cinereus</i> hoary bat	AMACC05030	None	None	G3G4	S4	
<i>Lasthenia burkei</i> Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
<i>Lasthenia californica</i> <i>ssp. bakeri</i> Baker's goldfields	PDAST5L0C4	None	None	G3T1	S1	1B.2
<i>Lasthenia californica</i> <i>ssp. macrantha</i> perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
<i>Lasthenia conjugens</i> Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
<i>Lavinia symmetricus navarroensis</i> Navarro roach	AFCJB19023	None	None	G4T1T2	S2S3	SSC
<i>Lavinia symmetricus parvipinnis</i> Gualala roach	AFCJB19025	None	None	G4T1T2	S2S3	SSC
<i>Legenere limosa</i> legenere	PDCAM0C010	None	None	G2	S2	1B.1
<i>Leptosiphon jepsonii</i> Jepson's leptosiphon	PDPLM09140	None	None	G2G3	S2S3	1B.2
<i>Leptosiphon rosaceus</i> rose leptosiphon	PDPLM09180	None	None	G1	S1	1B.1
<i>Lessingia arachnoidea</i> Crystal Springs lessingia	PDAST5S0C0	None	None	G2	S2	1B.2
<i>Lichnanthe ursina</i> bumblebee scarab beetle	IICOL67020	None	None	G2	S2	
<i>Lilium pardalinum</i> <i>ssp. pitkinense</i> Pitkin Marsh lily	PMLIL1A0H3	Endangered	Endangered	G5T1	S1	1B.1
<i>Limnanthes vincularis</i> Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
<i>Linderiella occidentalis</i> California linderiella	ICBRA06010	None	None	G2G3	S2S3	
<i>Lupinus tidestromii</i> Tidestrom's lupine	PDFAB2B3Y0	Endangered	Endangered	G1	S1	1B.1
<i>Microseris paludosa</i> marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2



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<i>Myotis evotis</i> long-eared myotis	AMACC01070	None	None	G5	S3	
<i>Myotis thysanodes</i> fringed myotis	AMACC01090	None	None	G4	S3	
<i>Navarretia leucocephala ssp. bakeri</i> Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
<i>Navarretia leucocephala ssp. plieantha</i> many-flowered navarretia	PDPLM0C0E5	Endangered	Endangered	G4T1	S1	1B.2
<i>Northern Coastal Salt Marsh</i> Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
<i>Northern Hardpan Vernal Pool</i> Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
<i>Northern Vernal Pool</i> Northern Vernal Pool	CTT44100CA	None	None	G2	S2.1	
<i>Oncorhynchus kisutch pop. 4</i> coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G5T2T3Q	S2	
<i>Oncorhynchus mykiss irideus pop. 8</i> steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
<i>Pandion haliaetus</i> osprey	ABNKC01010	None	None	G5	S4	WL
<i>Pelecanus occidentalis californicus</i> California brown pelican	ABNFC01021	Delisted	Delisted	G4T3T4	S3	FP
<i>Piperia candida</i> white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
<i>Pleuropogon hooverianus</i> North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
<i>Polemonium carneum</i> Oregon polemonium	PDPLM0E050	None	None	G3G4	S2	2B.2
<i>Polygonum marinense</i> Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
<i>Potentilla uliginosa</i> Cunningham Marsh cinquefoil	PDROS1B4A0	None	None	GX	SX	1A
<i>Rana boylei</i> foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
<i>Rana draytonii</i> California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
<i>Rhynchospora alba</i> white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
<i>Rhynchospora californica</i> California beaked-rush	PMCYP0N060	None	None	G1	S1	1B.1
<i>Rhynchospora capitellata</i> brownish beaked-rush	PMCYP0N080	None	None	G5	S1	2B.2



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<i>Rhynchospora globularis</i> round-headed beaked-rush	PMCYP0N0W0	None	None	G4	S1	2B.1
<i>Riparia riparia</i> bank swallow	ABPAU08010	None	Threatened	G5	S2	
<i>Sidalcea calycosa ssp. rhizomata</i> Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2	1B.2
<i>Sidalcea malviflora ssp. purpurea</i> purple-stemmed checkerbloom	PDMAL110FL	None	None	G5T1	S1	1B.2
<i>Silene scouleri ssp. scouleri</i> Scouler's catchfly	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
<i>Speyeria zerene myrtleae</i> Myrtle's silverspot butterfly	IILEPJ608C	Endangered	None	G5T1	S1	
<i>Spirinchus thaleichthys</i> longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
<i>Streptanthus glandulosus ssp. hoffmanii</i> Hoffman's bristly jewelflower	PDBRA2G0J4	None	None	G4T2	S2	1B.3
<i>Streptanthus morrisonii ssp. hirtiflorus</i> Dorr's Cabin jewelflower	PDBRA2G0S2	None	None	G2T1	S1	1B.2
<i>Streptanthus morrisonii ssp. morrisonii</i> Morrison's jewelflower	PDBRA2G0S3	None	None	G2T1?	S1?	1B.2
<i>Syncaris pacifica</i> California freshwater shrimp	ICMAL27010	Endangered	Endangered	G2	S2	
<i>Taricha rivularis</i> red-bellied newt	AAAAF02020	None	None	G2	S2	SSC
<i>Taxidea taxus</i> American badger	AMAJF04010	None	None	G5	S3	SSC
<i>Thaleichthys pacificus</i> eulachon	AFCHB04010	Threatened	None	G5	S2	
<i>Thamnia vermicularis</i> whiteworm lichen	NLTES43860	None	None	G5	S1	2B.1
<i>Trifolium amoenum</i> two-fork clover	PDFAB40040	Endangered	None	G1	S1	1B.1
<i>Trifolium buckwestiorum</i> Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
<i>Trifolium hydrophilum</i> saline clover	PDFAB400R5	None	None	G2	S2	1B.2
<i>Triphysaria floribunda</i> San Francisco owl's-clover	PDSCR2T010	None	None	G2?	S2?	1B.2
<i>Triquetrella californica</i> coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
<i>Tryonia imitator</i> mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	



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<i>Usnea longissima</i> Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
<i>Vespericola marinensis</i> Marin hesperian	IMGASA4140	None	None	G2	S2	
<i>Viburnum ellipticum</i> oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 147