3.2.5 Threatened and Endangered Species

3.2.5.1 Overview

In addition to this introductory information, this section is divided into three subsections. Section 3.2.5.2 identifies ESA-listed species,[1] Section 3.2.5.3 includes a general life history for each ESA-listed species, and Section 3.2.5.4 describes known or potential Project effects on ESA-listed species.

SSWD prepared this section on its collection of existing, relevant, and reasonably available information on ESA-listed species. Specifically, SSWD found 21 source documents regarding ESA-listed species. These are listed below and cited throughout the section.

- Allen and Tennant 2000
- CDFG 1987
- CDFW 2014d
- CDFW 2015a
- CNPS 2015
- Contra Costa County 2006
- Garnet and Drum 1981
- Hayes and Jennings 1988
- Hughes 1999
- Jennings and Hayes 1994
- Jepson Interchange 2015
- NMFS 2014
- PFMC 2014
- USFWS 1997b
- USFWS 2001
- USFWS 2005a
- USFWS 2006
- USFWS 2010b
- USFWS 2015a

[1] For the purpose of this PAD, "*ESA-listed species*" is a species that has a reasonable likelihood of being affected by the Project and is listed as threatened (FE) or endangered (FE) under the ESA, or a species that is a candidate or proposed for listing under the ESA. Species for which NMFS or USFWS have completed a 90-day review and determined that significant information exists, are not considered ESA-listed species, and are likely discussed in Section 3.2.3 or 3.2.4.

- USFWS 2015d
- Sycamore Environmental 2013

3.2.5.2 ESA-Listed Species

3.2.5.2.1 Listed Plants and Animals

On August 25, 2015, SSWD generated a list of ESA-listed species by using the on-line IPaC at the USFWS' website (USFWS 2015a) (Attachment 3.2.5A). The IPaC query included a user-defined polygon that encompassed the existing FERC Project Boundary plus the reach of the Bear River that extends from Camp Far West Dam downstream to the Feather River confluence, and a 1-mi wide buffer around this entire area. The resulting list included 10 species: 4 invertebrates; 1 amphibian; 1 reptile; 3 fishes; and 1 bird. These were:

- Endangered:
  - Conservancy fairy shrimp (*Branchinecta conservatio*)
  - Vernal pool tadpole shrimp and critical habitat (*Lepidurus packardi*)
- Threatened:
  - Vernal pool fairy shrimp and critical habitat (*Branchinecta lynchi*)
  - California red-legged frog and critical habitat (*Rana draytonii*)
  - Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), Western U.S. Distinct Population Segment DPS
  - Delta smelt (*Hypomesus transpacificus*)
  - Steelhead, California Central Valley DPS (*Oncorhynchus mykiss)* and critical habitat
  - Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
  - Giant garter snake (*Thamnophis gigas*)
  - Central Valley spring-run Chinook salmon (*O. tshawytscha*) ESU and critical habitat

No candidate species or species proposed for listing were identified.

SSWD eliminated from further consideration the Delta smelt because this species does not occur in or near the Project Vicinity. The species is endemic to the Sacramento-San Joaquin estuary and historically was documented to only occur upstream in the Sacramento River to the City of Sacramento (Moyle et al. 1992). Therefore, nine species on USFWS' August 25, 2015 list could potentially be affected by continued Project O&M and associated recreation.

Following its IPaC query, SSWD searched several sources to identify additional ESA-listed species that are known or have the potential to occur within the Project Vicinity. For fish and wildlife, the information sources included Cal Fish and Wildlife's CNDDB (CDFW 2015a), the CWHR (CDFW 2014d), Camp Far West BA (Sycamore Environmental 2013) and NMFS' and USFWS' recovery plans. For plants, Cal Fish and Wildlife's CNDDB (CDFW 2015a) and

CNPS' database (CNPS 2015) were used to query for the Project Vicinity plus an additional buffer of one USGS quadrangle. SSWD also searched for and reviewed relevant and readily available reports (e.g., BAs, EIRs and EISs) and critical habitat designations that pertain to the Project Vicinity. This search identified two plant species:

- Endangered:
  - Hartweg's golden sunburst (*Pseudobahia bahiifolia*)
- Threatened:
  - Layne's ragwort (*Packera layneae*)

No candidate species or species proposed for listing were identified in this additional search.

Due to the elevation range of the Project, SSWD eliminated from further consideration Layne's ragwort because this plant is found at elevations of approximately 1,000 ft and above (Jepson Interchange 2015).

Based on SSWD's searches, a total of 10 species–3 endangered species and 7 threatened species–could potentially be affected by continued Project O&M and associated recreation. No candidate or proposed for listing species are potentially affected. Table 3.2.5-1 provides for each of these ESA-listed species: 1) a description of the species' habitat requirements; and 2) references to any recovery plans or status reports pertaining to that species.

Table 3.2.5-1. ESA-Listed species occurring or potentially occurring in the Project Vicinity.

Common Name (Scientific Name)	Suitable Habitat Type	Known Occurrence in Project Vicinity	Status[1]	Status Reports and Recovery Plans Relevant to Project Vicinity
PLANTS				
Hartweg's golden sunburst (*Pseudobahia bahiifolia*)	Valley and foothill grassland, cismontane woodland (CNPS 2015).	Present in quads (Knights Ferry and Yuba City) adjacent to the Project Vicinity, (CNPS 2015).	FE, SE & CRPR 1B.1	None
INVERTEBRATES				
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	Occurs only in the Central Valley and adjacent foothills up to 3,000 feet elevation in association with blue elderberry (*Sambucus nigra* ssp. *canadensis*) (CNPS 2015).	Six occurrences found on CNDDB near Project Vicinity; four occurrences within Sheridan quad, one each in Nicolaus and Wheatland quads (CDFW 2015a).	FT	Recovery Plan (USFWS 1984)
Conservancy fairy shrimp (*Branchinecta conservatio*)	Occurs in vernal pools found on several different landforms, geologic formations and soil types. Observations suggest this species is often found in pools that are relatively large, and turbid, at elevations ranging from 16 to 5,577 ft. (USFWS 2005a).	Reported on the USFWS IPaC Trust Report (USFWS 2015a)	FT	Recovery Plan (USFWS 2005a)
Vernal pool fairy shrimp (*Branchinecta lynchi*)	Endemic to grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains, in rain-filled pools (CDFW 2014d).	Reported on the USFWS IPaC Trust Report (USFWS 2015a)	FT	Recovery Plan (USFWS 2005a)

Table 3.2.5-1. (continued)

Common Name (Scientific Name)	Suitable Habitat Type	Known Occurrence in Project Vicinity	Status[1]	Status Reports and Recovery Plans Relevant to Project Vicinity
INVERTEBRATES (cont'd)				
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water (CDFW 2014d).	Reported on the USFWS IPaC Trust Report (USFWS 2015a)	FE	Recovery Plan (USFWS 2005a)
AMPHIBIANS				
California red-legged frog (*Rana draytonii*)	Suitable habitat is located in deep (>0.7 m), still or slow-moving water within dense, shrubby riparian and upland habitats (Jennings and Hayes 1994).	Reported on the USFWS IPaC Trust Report (USFWS 2015a)	FT	Recovery Plan (USFWS 2002)
REPTILES				
Giant garter snake (*Thamnophis gigas*)	Prefers freshwater marsh and low gradient streams, has adapted to drainage canals and irrigation ditches (USFWS 2006)	Reported on the USFWS IPaC Trust Report (USFWS 2015a). Known occurrences in quads (Nicolaus) adjacent to the Project Vicinity (CDFW 2015a).	FT & ST	Status Report (Ellis 1987)
FISH				
Steelhead, California Central Valley DPS (*Oncorhynchus mykiss irideus*)	Spawning occurs within the Sacramento and San Joaquin rivers and their tributaries (NatureServe 2015). Habitat conditions are not suitable to support a self-sustaining population in the Bear River; intermittent spawning may occur during high flow years (NMFS 2014).	Reported on the USFWS IPac Trust Report (USFWS 2015a). Critical habitat designated in lower Bear River up to the Camp Far West Diversion Dam (70 FR 52488)	FT	Status Report (Busby et al. 1996; Good et al. 2005; NMFS 1997; NMFS 1998) Restoration and Management Plan (CDFG 1991b; CDFG 1993; CDFG 1996a) Recovery Plan (NMFS 2014)
Chinook salmon, Central Valley spring-run ESU (*Oncorhynchus tshawytscha*)	Spawning occurs within the Sacramento River and its tributaries. Habitat conditions in the Bear River are not suitable for Chinook salmon spawning (PFMC 2014).	Occurs in the Feather River. Critical habitat designated in the lower ~5 mi of the Bear River for intermittent non-natal juvenile rearing (70 FR 52488).	FT & ST	Status Report (CDFG 1996b,CDFG 1998b; Good et al. 2005; NMFS 1999) Restoration and Management Plan (CDFG 1991b; CDFG 1993) Recovery Plan (NMFS 2014)
BIRDS				
Western yellow-billed cuckoo, Western U.S. DPS (*Coccyzus americanus occidentalis*)	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems (CDFW 2014d).	This species was found adjacent to the Project Vicinity within the Nicolaus quad (CDFW 2015a).	FT, SE & BCC	Status Report (CDFG 1987)

[1] Status Codes:
BCC Bird of Conservation Concern
CRPR California Rare Plant Rank; 1B: Species considered rare, threatened or endangered in California and elsewhere.
1: Species seriously threatened in California
FE Endangered: Any species that is in danger of extinction throughout all or a significant portion of its range.
FT Threatened: Any species likely to become endangered within the near future.
SE Endangered: Listed as endangered under CESA.
ST Threatened: Listed as threatened under CESA.

As shown in Table 3.2.5-1, four of the ESA-listed species are also listed under the CESA: Hartweg's golden sunburst (SE); giant garter snake (ST); CV spring-run Chinook salmon ESU; and Western yellow-billed cuckoo, Western U.S. DPS (SE).

3.2.5.3 ESA Listed Species Life Histories

3.2.5.3.1 Hartweg's Golden Sunburst (FE, SE & CRPR 1B.1)[2]

3.2.5.3.1.1 Status and Critical Habitat

On February 6, 1997, the USFWS listed Hartweg's golden sunburst as an endangered species under the ESA (62 FR 5542). No critical habitat has been designated for Hartweg's golden sunburst (USFWS 2015c).

3.2.5.3.1.2 Recovery Plan

No Recovery Plan for Hartweg's golden sunburst has been developed (USFWS 2010b).

A 5-year review for the species was completed by USFWS in December 2007 with no change in designation recommended (USFWS 2010b).

3.2.5.3.1.3 Current and Historical Distribution

This species is found only in the Central Valley of California. Historically, the range of the species may have extended from Yuba County south to Fresno County, a range of 200 mi. Within this range, the species was only locally abundant. Today, there are 16 populations on the eastern edge of the San Joaquin Valley. Remaining populations are concentrated in the Friant region of Fresno and Madera counties and the La Grange region in Stanislaus County (USFWS 2010b).

This plant was found in the Knights Ferry and Yuba City USGS quadrangles near the Project Vicinity in the CNDDB search (CDFW 2015a).

3.2.5.3.1.4 Life History and Habitat Requirements

Hartweg's golden sunburst is an annual herb (i.e. plant surviving for just one growing season) of the aster family. It is a small plant of about 2 to 8 in. tall with linear leaves. Like many other asters, it has a sunflower-like flower head with yellow ray and disk flowers (Baldwin et al. 2012).

Hartweg's golden sunburst occurs in open grasslands and grasslands at the margins of blue oak woodland, primarily on shallow, well-drained, fine-textured soils, and nearly always on the north or northeast facing side of Mima mounds. These are mounds of earth roughly 1 to 6 ft high and

[2] Photo source: <http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+1207+0492>.

10 to 100 ft in diameter at the base, interspersed with basins that may pond water in the rainy season (USFWS 2010b).

3.2.5.3.1.5 Stressors and Limiting Factors

USFWS reports the primary threat to Hartweg's golden sunburst is the conversion of natural habitat to residential and agricultural development (62 FR 5542). In addition, the majority of occurrences are located on private lands where they receive little protection.

3.2.5.3.2 Valley Elderberry Longhorn Beetle (FT)[3]

3.2.5.3.2.1 Status and Critical Habitat

On August 8, 1980, USFWS listed VELB as a threatened species (45 FR 52803). Critical habitat has been designated for the species, including the American River Parkway and Sacramento zones. The Project is outside of the critical habitat zones designated by USFWS, but portions of the Project fall within the potential range of the beetle (45 FR 52803). According to the USFWS critical habitat Mapper, the closest critical habitat designation lies 29.2 mi south of Camp Far West Reservoir along the American River (USFWS 2015g).

3.2.5.3.2.2 Recovery Plan

The USFWS issued a VELB Recovery Plan on August 28, 1984. On February 14, 2007, the USFWS completed a 5-year review, which resulted in USFWS' recommendation that the species be de-listed. In October of 2012, the USFWS began the process of reviewing the de-listing proposal, but it was withdrawn in September 2014 (USFWS 2015g).

3.2.5.3.2.3 Current and Historical Distribution

VELB is one of two subspecies of *Desmocerus californicus*. The other subspecies, the California elderberry longhorn beetle (*Desmocerus californicus californicus*), is found primarily in coastal areas from Mendocino County to San Diego County and in the southern Sierra Nevada range. The range of the VELB extends throughout California's Central Valley and associated foothills from about the 3,000-ft elevation contour on the east and the watershed of the Central Valley on the west. All or portions of 31 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo and Yuba (USFWS 1999a).

[3] Photo source: <https://instruct1.cit.cornell.edu/courses/icb344/abstracts/valley-elderberry-beetle.htm>.

In the CNDDB search, VELB was found near the Project Vicinity in the Sheridan and Wheatland quads (CDFW 2015a).

3.2.5.3.2.4 Life History and Habitat Requirements

The VELB is dependent on its host plant, blue elderberry (*Sambucus nigra* spp. *canadensis*), which is a common component of riparian corridors and adjacent upland areas in the Central Valley. There are four stages of this species' life: egg, larva, pupa and adult. Females deposit eggs on or adjacent to the host elderberry. Egg production varies, and females have been observed to lay between 16 and 180 eggs. Eggs hatch within a few days of being deposited and larvae emerge. The larvae bore into the wood of the host plant and create a long feeding gallery in the pith of the elderberry stem. The larvae feed on the pith of the plant for 1 to 2 years. When a larva is ready to pupate, it chews an exit hole to the outside of the stem and then plugs it with frass.[4] The larva then retreats into the feeding gallery and constructs a pupal chamber from wood and frass. The larvae metamorphose between December and April; the pupal stage lasts about a month. The adult remains in the chamber for several weeks after metamorphous, and then emerges from the chamber through the exit hole.[5] (USFWS 2015g.)

Adults generally emerge from late-March through June and are short-lived; however, most records for adults occur from late-April to mid-May. Adults feed on elderberry leaves and mate within the canopy (USFWS 2015g).

3.2.5.3.2.5 Stressors and Limiting Factors

The USFWS considers VELB, though wide-ranging, to be in long-term decline due to human activities that have resulted in widespread alteration and fragmentation of riparian habitats, and to a lesser extent, upland habitats, which support the beetle. The primary threats to the survival of the beetle include:

- Loss and alteration of habitat by agricultural conversion
- Overgrazing
- Levee construction
- Stream and river channelization
- Removal of riparian vegetation
- Rip-rapping of shoreline
- Non-native animals, such as the Argentine ant (*Linepithema humile*), which may eat the early phases of the beetle
- Recreational, industrial and urban development

[4] Frass is the debris or excrement produced by the insect.
[5] Photo source: <http://www.riverpartners.org/news-and-events/newsletters/201009_VELB.html>.

- Non-native or invasive plant species, such as giant reed (*Arundo donax*), Himalayan blackberry (*Rubus armeniacus*), and fig (*Ficus carica*), may also negatively affect the health and vigor of the host plant for VELB

Indiscriminant insecticide and herbicide use in agricultural areas and along road right-of-ways may also be factors limiting the beetle's distribution. The age and quality of individual elderberry shrubs/trees and stands may also be a factor in its limited distribution because elderberry leaves and flowers are also the beetle's only food source (USFWS 2015g).

3.2.5.3.3 Conservancy Fairy Shrimp (FE)[6]

3.2.5.3.3.1 Status and Critical Habitat

Conservancy fairy shrimp was listed under the ESA on October 19, 1994 (USFWS 2015d).

USFWS designated approximately 858,846 ac of critical habitat for 4 vernal pool crustaceans and 11 vernal pool plants in 34 counties in California and 1 county in southern Oregon in a final rule dated August 11, 2005 (70 FR 46924). This ruling included the conservancy fairy shrimp. The final designation of critical habitat for conservancy fairy shrimp is 161,786 ac. Critical habitat units are outlined in Butte, Colusa, Mariposa, Merced, Solano, Stanislaus, Tehama, and Ventura counties, CA (71 FR 7122).

3.2.5.3.3.2 Recovery Plan

The USFWS issued a Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon in October 2004; the recovery plan was finalized on December 15, 2005 (USFWS 2005a).

3.2.5.3.3.3 Current and Historical Distribution

The historical distribution of the conservancy fairy shrimp is not known. However, the distribution of vernal pool habitats in the areas where the conservancy fairy shrimp is now known to occur was once more continuous and larger in area than they are today. It is likely the conservancy fairy shrimp once occupied suitable vernal pool habitats throughout a large portion of the California Central Valley and southern coastal regions of California (Holland 1998).

According to Placer County Natural Resources Report, the closest occurrence of the conservancy fairy shrimp is approximately 9.5 mi southeast of Camp Far West Reservoir (Placer County 2004). No records of conservancy fairy shrimp species were found within the Project Vicinity in the CNDDB search (CDFW 2015a).

[6] Photo credit Dwight Harvey, United States Department of Interior (USDOI), Fish and Wildlife Service (USFWS). URL: http://www.fws.gov/sacramento/es/animal_spp_acct/conserv_shrimp.pdf

3.2.5.3.3.4 Life History and Habitat Requirements

Fairy shrimp are the 1-inch-long relatives of lobsters and crabs, all of which are crustaceans. They are translucent and have 11 pairs of appendages. The conservancy fairy shrimp inhabits large, cool-water vernal pools with moderately turbid water (King et al. 1996, Helm 1998, Eriksen and Belk 1999). The life history of the conservancy fairy shrimp is adapted to the cyclical nature of vernal pools. Adult shrimp have been collected in the wet season, from November to early April. When the pool dries out, so do the eggs, which withstand heat, cold and prolonged desiccation. Hatching can initiate the same week that a pool starts to fill. Time to maturity decreases with heat stress and averages about 490 days (Eriksen and Belk 1999). Conservancy fairy shrimp co-occur with vernal pool fairy shrimp (King et al. 1996, Helm 1998, Eriksen and Belk 1999). However, they have rarely been collected from the same pool at the same time (Eriksen and Belk 1999). In general, populations of conservancy fairy shrimp within a given pool are very large, and are usually the most abundant fairy shrimp when more than one species is present (Helm 1998, Eriksen and Belk 1999).

The conservancy fairy shrimp does not appear to discriminate substantially between landforms, geologic formations, or soil types. Helm (1998) found the mean size of pools supporting this species to be 299,936 sq ft, exceeding the average mean size of pools used by all other vernal pool branchiopods in the study. The species has been observed at sites that are low in alkalinity and total dissolved solids with pH near 7 (Syrdahl 1993, Eriksen and Belk 1999). Conservancy fairy shrimp have been found at elevations ranging from 16 to 5,577 ft (Eriksen and Belk 1999), and at water temperatures as high as 73°F (Syrdahl 1993).

3.2.5.3.3.5 Stressors and Limiting Factors

The current status and continuing threat to the survival and recovery of conservancy fairy shrimp is attributable to extensive loss of suitable habitat from agricultural conversion, urbanization and surface mining. Habitat loss also occurs as a result of changes to natural hydrology, introduction of invasive species, introduction of incompatible grazing regimes (e.g., insufficient grazing for prolonged periods), infrastructure development projects (e.g., roads, water storage and conveyance, utilities), recreational activities (e.g., off-highway vehicles and hiking), erosion, climatic and environmental change and contamination (USFWS 2005a).

3.2.5.3.4 Vernal Pool Fairy Shrimp (FT) and Vernal Pool Tadpole Shrimp (FE)[7,8]

3.2.5.3.4.1 Status and Critical Habitat

Vernal pool fairy shrimp and vernal pool tadpole shrimp were listed under the ESA on September 19, 1994 (59 FR 48136).

[7] Photo source: <http://www.fws.gov/cno/es/images/Graphics/VPFS_5-yr%20review%20CNO%20FINAL%2027Sept07.pdf>.
[8] Photo source: <http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0102+0261>.

Critical habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp, along with other vernal pool species, was originally designated in final rule on August 6, 2003 (68 FR 46684). The revised final rule for critical habitat was published on February 10, 2006, providing 35 critical habitat units for the vernal pool fairy shrimp, totaling 597,821 ac, and 18 critical habitat units for the vernal pool tadpole shrimp, totaling 228,785 ac (71 FR 7118). The closest critical habitat units to the Project are approximately 4.3 mi away, just outside of Lincoln's Regional Airport for vernal pool fairy shrimp only, and 7.5 mi away, just outside of Beale Air Force Base for both species (USFWS 2015e).

3.2.5.3.4.2 Recovery Plan

The USFWS issued a Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon in October 2004; the recovery plan was finalized on December 15, 2005 (USFWS 2005a).

A 5-year review, initiated in 2006, concluded with a recommendation of no status change for vernal pool fairy shrimp or vernal pool tadpole shrimp (73 FR 11945). Another 5-year review was initiated on May 25, 2011 (76 FR 30377).

3.2.5.3.4.3 Current and Historical Distribution

The vernal pool fairy shrimp occurs in California from Shasta County south to Tulare County and in Jackson County, Oregon. Most of the known occurrences are on the eastern side of the Central Valley and in the central Coast Ranges, with disjunct populations in San Luis Obispo County, Santa Barbara County and Riverside County, California, and southern Oregon (Eng et al. 1990, Eriksen and Belk 1999). Although the species has a wide geographic range, populations are usually small. Extensive conversion of natural habitats for agriculture, urban development, landfills, and water supply/flood control projects has substantially diminished and fragmented the historical range. The long-term viability of populations may be associated with vernal pool complexes where there are suitable pools under different climatic conditions. The current distribution of the species includes small or isolated populations that are probably not viable.

The vernal pool tadpole shrimp is currently distributed across the Central Valley of California and in the San Francisco Bay area. The species' distribution has been greatly reduced from historical times as a result of widespread destruction and degradation of its vernal pool habitat. Vernal pool habitats in the Central Valley now represent only about 25 percent of their former area, and remaining habitats are considerably more fragmented and isolated than during historical times (Holland 1998). Vernal pool tadpole shrimp are uncommon even where vernal pool habitats occur. Helm (1998) found vernal pool tadpole shrimp in only 17 percent of vernal pools sampled across 27 counties, and Sugnet (1993) found this species at only 11 percent of 3,092 locations.

In the Northwestern Sacramento Vernal Pool Region, vernal pool tadpole shrimp are found at the Stillwater Plains and in the vicinity of the City of Redding in Shasta County (USFWS 2015e).

In the Northeastern Sacramento Vernal Pool Region, vernal pool tadpole shrimp have been documented on private land in the vicinity of Chico in Butte County. They have also been documented in Tehama County at the Vina Plains Preserve, the Dales Lake Ecological Reserve and on California Department of Transportation land (USFWS 2005a).

The largest concentration of vernal pool tadpole shrimp occurrences are found in the Southeastern Sacramento Vernal Pool Region, where the species occurs on a number of public and private lands in Sacramento County. Vernal pool tadpole shrimp are also known to occur in a few locations in Yuba and Placer counties, including Beale Air Force Base (USFWS 2005a).

In the Solano-Colusa Vernal Pool Region, the vernal pool tadpole shrimp occurs in the vicinity of Jepson Prairie, Travis Air Force Base, near Montezuma in Solano County and in the Sacramento National Wildlife Refuge in Glenn County. In the San Joaquin Vernal Pool Region, vernal pool tadpole shrimp are known to occur in the Grasslands Ecological Area, on private land in Merced County and in a single location in both Tulare and Kings counties. In the Southern Sierra Foothills region, the species occurs at the Stone Corral Ecological Preserve in Tulare County, on ranchlands in eastern Merced County, at the Big Table Mountain Preserve in Fresno County and at a few locations in Stanislaus County. In the Central Coast Vernal Pool Region, the vernal pool tadpole shrimp is found on the San Francisco National Wildlife Refuge and private land in Alameda County (USFWS 2005a).

According to Placer County Natural Resources Report, the closest occurrence of the vernal pool fairy shrimp is approximately 5 mi southeast of Camp Far West Reservoir. Similarly, the closest occurrence of the vernal pool tadpole shrimp is approximately 15 mi southeast of the reservoir (Placer County 2004). No records of either fairy shrimp species were found within the Project Vicinity in the CNDDB search (CDFW 2015a).

3.2.5.3.4.4 Life History and Habitat Requirements

Fairy shrimp are generally restricted to seasonal aquatic habitats where predatory fish do not occur. Female fairy shrimp of all species carry their eggs in a ventral brood sac. The eggs either are dropped to the pool bottom or remain in the brood sac until the mother dies and sinks. When the pool dries, the eggs dry and remain dormant in the dry pool bed until rain and other environmental stimuli cause them to hatch. Resting fairy shrimp eggs are commonly referred to as cysts and capable of withstanding heat, cold and prolonged desiccation. When the pools refill, some, but not all, of the cysts may hatch. The cyst bank in the soil may contain cysts from several years of breeding (USFWS 2005a).

The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (Eng et al. 1990, Helm 1998). Although the vernal pool fairy shrimp has been collected from large vernal pools, including one exceeding 25 ac in area (Eriksen and Belk 1999), it tends to occur primarily in smaller pools (Platenkamp 1998); most frequently found in pools measuring less than 0.05-ac in area (Gallagher 1996, Helm 1998) in grass or mud-bottomed swales or basalt depression pools in grasslands that have not been mowed. The vernal pool fairy shrimp typically occurs at elevations from 30 to 4,000 ft (Eng et al. 1990), although two sites in the Los Padres National Forest have been found to contain the species at an elevation of 5,600 ft. The vernal pool fairy

shrimp has been collected at water temperatures as low as 4.5°C (Eriksen and Belk 1999) and has not been found in water temperatures above about 23°C (Helm 1998, Eriksen and Belk 1999). The species is typically found in pools with low to moderate amounts of salinity or total dissolved solids (Collie and Lathrop 1976, Keeley 1984, Syrdahl 1993). Vernal pools are mostly rain fed, resulting in low nutrient levels and dramatic daily fluctuations in pH, DO and carbon dioxide (Keeley and Zedler 1998). Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species. Platenkamp (1998) found no significant differences in vernal pool fairy shrimp distribution between four different geomorphic surfaces studied at Beale Air Force Base.

Although the vernal pool tadpole shrimp is adapted to survive in seasonally available habitat, the species has a relatively long life span, compared to other vernal pool crustaceans. Helm (1998) found that the vernal pool tadpole shrimp lived significantly longer than any other species observed under the same conditions, except for the California fairy shrimp. Vernal pool tadpole shrimp continue growing throughout their lives, periodically molting their shells. These shells can often be found in vernal pools where vernal pool tadpole shrimp occur. Helm (1998) found that vernal pool tadpole shrimp took a minimum of 25 days to mature and the mean age at first reproduction was 54 days.

3.2.5.3.4.5 Stressors and Limiting Factors

The current status and continuing threat to the survival and recovery of vernal pool fairy shrimp and vernal pool tadpole shrimp is attributable to extensive loss of suitable habitat from agricultural conversion, urbanization and surface mining. Habitat loss also occurs as a result of changes to natural hydrology, introduction of invasive species, introduction of incompatible grazing regimes (e.g., insufficient grazing for prolonged periods), infrastructure development projects (e.g., roads, water storage and conveyance, utilities), recreational activities (e.g., off-highway vehicles and hiking), erosion, climatic and environmental change and contamination (USFWS 2005a).

3.2.5.3.5 California Red-Legged Frog (FT)[9]

3.2.5.3.5.1 Status and Critical Habitat

The California Red-Legged Frog (CRLF) was listed as threatened on May 23, 1996 (61 FR 25813).

Critical habitat was originally designated for CRLF on March 13, 2001 and re-designated on April 13, 2006 (71 FR 19244). However, due to court challenges and questions about scientific validity, USFWS made a series of revisions to critical habitat for the CRLF. The final critical habitat designation was issued on March 17, 2010 (75 FR 12816). The closest critical habitat to the Project is approximately 24 mi away, just outside of Foresthill near Lake Clementine (USFWS 2015e).

[9] Photo source: <http://calphotos.berkeley.edu/imgs/512x768/0000_0000/1201/0035.jpeg>.

The criteria for the CRLF critical habitat are: 1) suitable aquatic habitat; 2) associated uplands; and 3) suitable dispersal habitat connecting suitable aquatic habitat (Allen and Tennant 2000; USFWS 2001). At a minimum, this will include two or more suitable breeding locations, one of which must be a permanent water source, associated uplands surrounding these water bodies (extending to 500 ft from the water's edge) all within 1.25 mi of one another and connected by barrier-free dispersal habitat of at least 500 ft in width.

3.2.5.3.5.2 Recovery Plan

A recovery plan has been developed for CRLF. Recovery criteria for this species include protection and management of suitable habitats within core areas, stable populations distributed within viable metapopulations, and re-establishment of at least one population within each core area where CRLF is currently absent (USFWS 2002).

3.2.5.3.5.3 Current and Historical Distribution

The historical range of the CRLF extends through Pacific slope drainages from Shasta County, California, to Baja California, Mexico, including the Coast Ranges and the west slope of the Sierra Nevada Range at elevations below 4,000 ft. The current range of this species is greatly reduced, with most remaining populations occurring along the coast from Marin County to Ventura County. In the Sierra Nevada region, where the species was once widespread, there are only eight known extant populations of CRLF, most of which contain few adults (Shaffer et al. 2004; Tatarian and Tatarian 2010; 71 FR 19244).

There is one known CRLF population in Yuba County, one in Nevada County and one in the adjacent County of Butte. No records of CRLF were found within the Project Vicinity in the CNDDB search (CDFW 2015a).

3.2.5.3.5.4 Life History and Habitat Requirements

CRLF breeding occurs from late November to late April in ponds or in backwater pools or creeks. Egg masses are attached to emergent vegetation such as cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.). Larvae remain in these aquatic habitats until metamorphosis. Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae typically metamorphose between July and September and most likely feed on algae (Jennings and Hayes 1994).

Outside of the breeding season, adults may disperse upstream, downstream, or upslope of breeding habitat to forage and seek sheltering habitat, which may consist of small-mammal burrows, leaf litter, and other moist sites in or near (i.e., up to 200 ft) from riparian areas (Jennings and Hayes 1994; 71 FR 19244). During wet periods, long distance dispersal of up to 1-mi may occur between aquatic habitats, including movement through upland habitats or ephemeral drainages (71 FR 19244). Seeps and springs in open grasslands can function as foraging habitat or refuges for wandering frogs (USFWS 1997b).

CRLF is primarily associated with perennial ponds or pools and perennial or seasonal streams where water remains for a minimum of 20 weeks beginning in the spring (i.e., sufficiently long

for breeding to occur and larvae to complete development) (Jennings and Hayes 1994, 71 FR 19244). Dense, shrubby riparian vegetation (e.g. willow [*Salix* spp.] and tule [*Schoenoplectus* spp.] species), and bank overhangs are important features of CRLF breeding habitat. Suitable aquatic habitats include natural and manmade ponds, backwaters within streams and creeks, marshes, lagoons and dune ponds. CRLF is not characteristically found in deep lacustrine habitats (e.g. deep lakes and reservoirs). A minimum water depth of 0.66-ft during the entire tadpole rearing season is required. Locations with the highest densities of CRLF exhibit dense emergent or shoreline riparian vegetation closely associated with moderately deep (greater than 2.3 ft), still, or slow-moving water. The types of vegetation that seem to provide the most suitable structure are willows, cattails and bulrushes at or close to the water level, which shade a substantial area of the water (Hayes and Jennings 1988). Another correlate to CRLF occurrence is the absence or near-absence of introduced predators, such as American bullfrog and predatory fish, particularly Centrarchids, which feed on the larvae at higher rates than native predatory species (Hayes and Jennings 1988), and mosquitofish. Hiding cover from predators may be provided by emergent vegetation, undercut banks and semi-submerged root wads (USFWS 2005b). Some habitats that are not suitable for breeding (e.g., shallow or short-seasonal wetlands, pools in intermittent streams, seeps and springs) may constitute habitats for aestivation, shelter, foraging, predator avoidance and juvenile dispersal.

The most comprehensive analysis of CRLF distribution and habitat use in the Sierra Nevada (Barry and Fellers 2013) suggests that historical CRLF habitat was associated with small, narrow, permanent or nearly permanent creeks near the headwaters, where small populations of CRLF occurred. Current available habitat in the species' range within the Sierra Nevada includes ponds of anthropogenic origin, including small instream impoundments (e.g., abandoned lumber mill ponds), excavated ponds, and mining tailing ponds.

Suitable upland habitat consists of all upland areas (riparian or otherwise) within 500 ft of the water's edge, but not further than the watershed boundary. This upland habitat is important in maintaining the integrity of CRLF aquatic/breeding habitat as land use activities adjacent to and upstream of suitable aquatic habitat greatly affect the quality of aquatic/breeding habitat downstream (Allen and Tennant 2000).

Suitable dispersal habitat consists of all upland and wetland habitat that connect two or more patches of suitable aquatic habitat within 1.25 mi of one another. Dispersal habitat must be at least 500 ft wide and free of barriers, such as heavily traveled roads (roads with more than 30 cars per hour), moderate to high-density urban or industrial developments and large reservoirs. The healthiest CRLF populations persist and flourish where suitable breeding and non-breeding habitats are interspersed throughout the landscape and are interconnected by un-fragmented dispersal habitat (Allen and Tennant 2000).

3.2.5.3.5.5 Stressors and Limiting Factors

According to the CRLF Recovery Plan (USFWS 2002), factors associated with declining populations of CRLF include degradation and loss of its habitat through: agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, the introduction of non-native plants that affect the frog's habitat, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators (e.g., American bullfrog, crayfish [*Procambarus clarkii*

and *Pacifastacus leniusculus*], and non-native predatory fish, such as smallmouth bass and mosquitofish). In an experiment, the presence of American bullfrog tadpoles significantly lowered survival of CRLF tadpoles to metamorphosis (Lawler et al. 1999), probably through competition.

3.2.5.3.6 Giant Garter Snake (FT & ST)[10]

3.2.5.3.6.1 Status and Critical Habitat

The giant garter snake was listed as threatened on November 19, 1993 (58 FR 54053). No critical habitat has been designated for this species.

3.2.5.3.6.2 Recovery Plan

The USFWS issued a Draft Recovery Plan for giant garter snakes on June 2, 1999, but the plan was never finalized (USFWS 1999b).

A 5-year review for the species was completed by USFWS in December 2007 with no change in designation recommended (USFWS 2006).

3.2.5.3.6.3 Current and Historical Distribution

Historically, this snake ranged from Kern County north along the Central Valley to Butte County, with a gap in the central part of the valley. Currently, the species ranges from Glenn County to the southern edge of the San Francisco Bay Delta, and from Merced County to northern Fresno County, apparently no longer occurring from south of northern Fresno County (California Herps 2015).

The CNDDB search indicated an occurrence of giant garter snake in the Nicolaus USGS quadrangle adjacent to the Project Vicinity (CDFW 2015a).

3.2.5.3.6.4 Life History and Habitat Requirements

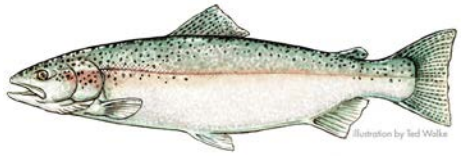
Endemic to valley floor wetlands in the Sacramento and San Joaquin valleys of California, the giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields (58 FR 54053). Key features of these habitats include: 1) adequate water during the active season (early spring through mid-fall) to uphold a sufficient prey base; 2) emergent vegetation for cover and foraging habitat; 3) upland habitat with grassy banks and openings to waterside vegetation for basking; and 4) higher elevation upland areas for cover and refuge from flood waters during the inactive season (Contra Costa County 2006).

[10] Photo source: <http://www.californiaherps.com/snakes/pages/t.gigas.html>.

3.2.5.3.6.5 Stressors and Limiting Factors

The species is threatened by habitat loss caused by numerous factors, primarily urbanization, agricultural, and flood control activities (56 FR 67046). Conversion of wetlands for agricultural, urban, and industrial development has resulted in the loss of over 90 percent of fit habitat for the giant garter snake in the Central Valley (Contra Costa County 2006).

3.2.5.3.7 Steelhead, California Central Valley DPS (FT)[11]



3.2.5.3.7.1 Status and Critical Habitat

On March 19, 1998 (63 FR 13347) NMFS listed the Central Valley DPS of steelhead as threatened, concluding that the risks to Central Valley (CV) steelhead had diminished since the completion of the 1996 status review based on a review of existing and recently implemented State conservation efforts and federal management programs (e.g., Central Valley Project Improvement Act Anadromous Fish Restoration Plan, CALFED Bay-Delta Program) that address key factors for the decline of this species. On January 5, 2006, NMFS reaffirmed the threatened status of the CV steelhead DPS (71 FR 834) and applied the DPS policy to the species because the resident and anadromous life forms of steelhead remain "markedly separated" as a consequence of physical, ecological and behavioral factors, and may therefore warrant delineation as a separate DPS (71 FR 834).

The DPS includes all naturally spawned anadromous *O. mykiss* populations below natural and man-made impassable barriers in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries (63 FR 13347). Two artificial propagation programs are considered to be part of the DPS-the Coleman National Fish Hatchery, and Feather River Fish Hatchery (FRFH) steelhead hatchery programs. NMFS determined that these artificially propagated stocks are no more divergent relative to the local natural populations than what would be expected between closely related natural populations within the DPS (71 FR 834).

On February 16, 2000 (65 FR 7764), NMFS published a final rule designating critical habitat for CV steelhead DPS. Critical habitat was designated to include all river reaches accessible to listed steelhead in the Sacramento and San Joaquin rivers and their tributaries in California. NMFS proposed new critical habitat for CV steelhead on December 10, 2004 (69 FR 71880) and published a final rule designating critical habitat on September 2, 2005 (70 FR 52488). In the Bear River, NMFS designates CV steelhead critical habitat to include the area defined in the CALWATER Marysville Hydrologic Unit 5515 (i) Lower Bear River Hydrologic Sub-area 551510. Outlet(s) = Bear River (Lat 39.9398, Long –121.5790) upstream to endpoint(s) in Bear River (39.0421, –121.3319), which means the upstream extent is at the non-Project diversion dam (70 FR 52488).

[11] Photo found at: http://www.fish.state.pa.us/pafish/steelhdm.jpg.

3.2.5.3.7.2 Recovery Plan

The Recovery Plan (NMFS 2014) states that the Bear River does not provide suitable habitat for self-sustaining populations of anadromous salmonids, including CV steelhead, and that any CV steelhead that intermittently spawn in the Bear River during high flow years are likely strays from the FRFH. Moreover, water temperatures during the summer likely preclude year-round juvenile rearing, indicating that any juveniles present would have to leave the river to continue to rear in freshwater.

3.2.5.3.7.3 Current and Historical Distribution

CV steelhead historically ranged throughout accessible tributaries and headwaters of the Sacramento and San Joaquin rivers prior to major dam construction, water development, and other watershed disturbances. In the Bear River, historic population estimates do not exist for steelhead.

CV steelhead was not reported on the CNDDB search in or near the Project Vicinity (CDFW 2015a)

3.2.5.3.7.4 Life History and Habitat Requirements

"Steelhead" is the name commonly applied to the anadromous form of the biological species *O. mykiss*. Steelhead exhibits perhaps the most complex suite of life-history traits of any species of Pacific salmonid. Members of this species can be anadromous or freshwater residents and, under some circumstances, members of one form can apparently yield offspring of another form.

Due to a lack of documentation of CV steelhead occurring in the Bear River, there is no information on the life history of any CV steelhead that may intermittently spawn there. However, assuming that CV steelhead that may spawn in the Bear River are likely FRFH-origin fish, recent studies in the lower Yuba River, another tributary to the Feather River, are likely representative of general life history conditions for steelhead that would have the potential to spawn in the Bear River, described below.

The Lower Yuba River Accord, River Management Team (RMT 2010; 2013) identified the period extending from August through March as encompassing the majority of the upstream migration and holding of adult CV steelhead in the lower Yuba River. CV steelhead adults typically spawn from December through April with peaks from January through March in small streams and tributaries where cool, well-oxygenated water is available year-round (Hallock et al. 1961; McEwan 2001). Based on all available information collected to date, the RMT (2013) recently identified the CV steelhead spawning period in the lower Yuba River as extending from January through April, with embryo incubation extending into May. Juvenile CV steelhead rearing in the lower Yuba River exhibits a variety of temporal periods. Some juvenile CV steelhead may rear in the lower Yuba River for a short duration (i.e., up to a few months) whereas others may spend from 1 to 3 years rearing in the river. Review of available data indicates that emigration of CV steelhead smolts 1 year old and older (yearling+) may extend from October through mid-April. (RMT 2010; 2013.)

Female steelhead construct redds within a range of depths and velocities in suitable gravels, oftentimes in pool tailouts and heads of riffles. Steelhead eggs incubate in redds for 3 to 14 weeks prior to hatching, depending on water temperatures (Shapovalov and Taft 1954; Barnhart 1991). After hatching, alevins, newly spawned salmon or trout still carrying the yolk, remain in the gravel for an additional 2 to 5 weeks while absorbing their yolk sacs prior to emergence (Barnhart 1991). The entire egg incubation life stage encompasses the time adult CV steelhead select a spawning site through the time when emergent fry exit the gravel (CALFED and YCWA 2005).

In general, it has been reported that after emergence, steelhead fry move to shallow-water, low-velocity habitats, such as stream margins and low gradient riffles, and will forage in open areas lacking instream cover (Hartman 1965; Everest et al. 1986; Fontaine 1988). As fry increase in size and their swimming abilities improve in late summer and fall, juvenile steelhead have been reported to increasingly use areas with cover and show a preference for higher velocity, deeper mid-channel areas near the thalweg (Hartman 1965; Everest and Chapman 1972; Fontaine 1988).

Juvenile steelhead have been reported to occupy a wide range of habitats, preferring deep pools as well as higher velocity rapid and cascade habitats (Bisson et al. 1982, 1988). During the winter period of inactivity, steelhead prefers low velocity pool habitats with large rocky substrate or woody debris for cover (Hartman 1965; Swales et al. 1986; Raleigh et al. 1984; Fontaine 1988). During periods of low temperatures and high flows associated with the winter months, juvenile steelhead seek refuge in interstitial spaces in cobble and boulder substrates (Bustard and Narver 1975; Everest et al. 1986).

Aside from cutthroat trout (*O. clarki)*, steelhead is the only anadromous species of the genus *Oncorhynchus* in which adults can survive spawning and return to fresh water to spawn in subsequent years. Individuals that survive spawning return to sea between April and June (Mills and Fisher 1994). The frequency of repeat spawning is higher for females than for males (Ward and Slaney 1988; Meehan and Bjornn 1991; Behnke 1992). In the Sacramento River, Hallock (1989) reported that 14 percent of CV steelhead returned to spawn a second time. In the lower Yuba River, Mitchell (2010) reports that, based on scale analysis, 2 of the 10 wild CV steelhead were on their second spawning migration at the time of capture, as indicated by a spawning check between the first and second ocean growth zones.

3.2.5.3.7.5 Stressors and Limiting Factors

Major modifications to habitat in the Bear River result from water diversions during the irrigation season, historical hydraulic mining, and construction of Rollins Dam which caused a substantial reduction in downstream sediment transport. It is estimated that 125 million cubic meters (160 million cu yds) of mining sediment is stored in the lower Bear River. The high volume of mining sediment, as well as the restricting levees, has resulted in a shallow and deeply incised channel in the lower Bear River (NMFS 2014).

Inadequate flow in the Bear River reportedly prevents the establishment of a self-sustaining CV steelhead population; however, during high flow events CV steelhead are known to utilize the river for limited spawning. Because CV steelhead spawning likely only occurs during wet years, existing flow conditions are likely adequate to support CV steelhead embryo incubation.

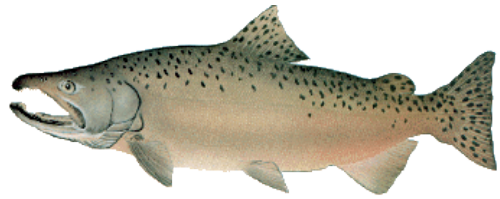
However, the current system of diversions in the Bear River Watershed results in abnormal flow fluctuations, in contrast to historical natural seasonal flow variations (NMFS 2014).

Although flows may be sufficient for CV steelhead embryo incubation during the years when they are able to spawn in the Bear River, reports that physical habitat conditions in the Bear River below Camp Far West Reservoir currently are not suitable for the natural production of anadromous fish, including CV steelhead. Salmonid spawning is reportedly severely limited due to silted spawning gravel in the Bear River (NMFS 2014).

The USFWS identified high water temperatures as one of the factors limiting CV steelhead production in the Bear River, which likely preclude CV steelhead over-summer juvenile rearing in the Bear River. However, NMFS (2014) states that water temperatures should be cool enough by November to support CV steelhead adult immigration and are cool enough during the winter months to support CV steelhead spawning and embryo incubation. Therefore, while CV steelhead may immigrate and spawn in the Bear River during some years, juveniles would likely have to leave the Bear River to continue to rear in freshwater.

Because habitat conditions do not support a self-sustaining population of CV steelhead in the Bear River, CV steelhead that spawn during high flow years likely originated from the FRFH (NMFS 2014).

3.2.5.3.8 Chinook Salmon, Central Valley Spring-Run ESU (FT & ST)[12]



3.2.5.3.8.1 Status and Critical Habitat

On September 16, 1999, NMFS listed the Central Valley ESU of spring-run Chinook salmon as threatened (64 FR 50394). On June 14, 2004, following a 5-year species status review, NMFS proposed that CV spring-run Chinook salmon remain a threatened species based on the Biological Review Team's strong majority opinion that the CV spring-run Chinook salmon ESU is ''likely to become endangered within the foreseeable future'' due to the greatly reduced distribution of CV spring-run Chinook salmon and hatchery influences on the natural population. On June 28, 2005, NMFS reaffirmed the threatened status of the CV spring-run Chinook salmon ESU, and included the FRFH spring-run Chinook salmon population as part of the CV spring-run Chinook salmon ESU (70 FR 37160).

Critical habitat was designated for the CV spring-run Chinook salmon ESU on September 2, 2005 (70 FR 52488). The ESU for CV spring-run Chinook salmon is defined as all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries, including the FRFH population. In the Bear River, NMFS designates CV spring-run Chinook salmon critical habitat to include the area defined in the CALWATER Marysville HU 5515, Lower Yuba River Hydrologic Sub-area 551510. Outlet(s) = Bear River (Lat 38.9398, Long-121.5790) upstream to endpoint(s) in: Bear River (38.9783,-121.5166), which means the upstream extent is approximately to RM 5 in the Bear River (70 FR 52488).

[12] Photo found at: http://pictures.thesalmon.com.ar/salmonpicturesChinookSalmon.html.

3.2.5.3.8.2 Recovery Plan

The NMFS (2014) Recovery Plan states that the Bear River does not provide suitable habitat for self-sustaining populations of anadromous salmonids. Moreover, water temperatures during the summer likely preclude year-round juvenile rearing. CV spring-run Chinook salmon use of the lower Bear River is likely restricted to use by non-natal juveniles originating from the Feather or Yuba rivers during higher flow years.

3.2.5.3.8.3 Current and Historical Distribution

Section 305(b)(2) of the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (16 USC 1801 et seq.) requires the identification of EFH for federally managed fishery species and the implementation of measures to conserve and enhance this habitat. In the Mid-Pacific Region, the Pacific Fisheries Management Council designates EFH and NMFS approves the designation. EFH includes specifically identified waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity and covers a species' full life cycle (16 USC 1802(10)). EFH only applies to commercial fisheries. Chinook salmon habitat has been identified as Pacific salmon EFH in the Bear River upstream to Camp Far West Dam (PFMC 2014). EFH applies to all runs of Chinook salmon potentially present in the Bear River.

Four distinct runs of Chinook salmon spawn in the Sacramento-San Joaquin River system, with each run named for the season when the majority of the run enters freshwater as adults. Historically, spring-run Chinook salmon occurred in the headwaters of all major river systems in the Central Valley where natural barriers to migration were absent. Beginning in the 1880s, harvest, water development, construction of dams that prevented access to headwater areas, and habitat degradation significantly reduced the number and range of CV spring-run Chinook salmon. Presently, Mill, Deer, and Butte creeks in the Sacramento River system support self-sustaining, persistent populations of CV spring-run Chinook salmon.

The upper Sacramento, Yuba, and Feather rivers also are reported to support CV spring-run Chinook salmon. However, these populations may be hybridized to some degree with fall-run Chinook salmon. CV spring-run Chinook salmon acquired and maintained genetic integrity through reproductive (spatial-temporal) isolation from other CV Chinook salmon runs. However, construction of dams has prevented access to headwater areas and much of this historical reproductive isolation has been compromised, resulting in intermixed life history traits in many remaining habitats.

3.2.5.3.8.4 Life History and Habitat Requirements

NMFS (2014) reports that the Bear River does not provide adequate physical habitat or suitable flow or water temperature conditions that could support self-sustaining anadromous salmonid populations. CV spring-run Chinook salmon was not identified in NMFS (2014) Recovery Plan as a species that historically or currently exists in the Bear River. However, as previously mentioned, NMFS did designate critical habitat for CV spring-run Chinook salmon in the lowest 5 mi of the Bear River for non-natal juvenile rearing (70 FR 52488). NMFS included the lower reach of the Bear River in the critical habitat designation, in part, because the habitat may serve

as refugia from high water conditions and catastrophic events (70 FR 52488), which suggests that non-natal juvenile CV spring-run Chinook salmon, presumably originating from the Feather River or Yuba River, may utilize the lower Bear River during high flow events. If non-natal juvenile CV spring-run Chinook salmon primarily access the lower Bear River during high flow years, flow-dependent habitat in the lower Bear River would likely not be limiting during those periods.

CV spring-run Chinook salmon fry generally emerge from the gravel from November to March (Moyle 2002). Most juvenile Chinook salmon emigrate from the lower Feather River within a few months of emergence. However, some CV spring-run Chinook salmon juveniles reportedly rear for up to 15 months prior to emigrating (NMFS 2014). While non-natal juvenile CV spring-run Chinook salmon may rear year-round, based on the generally unsuitable habitat conditions in the lower Bear River during the summer and fall, juveniles would likely only utilize the lower Bear River during the higher flow spring months.

The CNDDB had no reports of the CV spring-run Chinook salmon in or near the Project Vicinity (CDFW 2015a).

3.2.5.3.8.5 Stressors and Limiting Factors

Although the Bear River historically supported fall-run Chinook salmon, CV spring-run Chinook salmon were apparently not present. This may be in part due to the fact that a natural waterfall blocked Chinook salmon in the vicinity of the present day Camp Far West Reservoir (Yoshiyama et al. 2001), which would have prevented CV spring-run Chinook salmon from immigrating and spawning in their preferred habitats in the higher elevation reaches of Central Valley streams.

3.2.5.3.9 Western Yellow-Billed Cuckoo, Western U.S. DPS (FT, SE & BCC)[13]

3.2.5.3.9.1 Status and Critical Habitat

On November 03, 2014 the Western yellow-billed cuckoo was federally listed as threatened. Prior to this, on August 15, 2014, the USFWS proposed to designate critical habitat for the western DPS of the yellow-billed cuckoo (western yellow-billed cuckoo) under the ESA (50 CFR 48548). A proposed 546,335 ac of critical habitat for the western DPS of the yellow-billed cuckoo in 80 separate units in Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah and Wyoming are up for consideration. None of the proposed units are in the Project Vicinity.

3.2.5.3.9.2 Recovery Plan

There is no current recovery plan available for the western yellow-billed cuckoo, Western U.S DPS (USFWS 2015f).

[13] Photo found at: http://www.allaboutbirds.org/guide/Yellow-billed_Cuckoo/id.

3.2.5.3.9.3 Current and Historical Distribution

Historically, breeding western yellow-billed cuckoos occurred west of the Continental Divide, from British Columbia south into northern Mexico. It no longer occurs in much of its historic range, but breeds instead rarely and locally along rivers in Arizona, California, and New Mexico. They migrate to wintering grounds in South America (USFWS 2013b).

Along the Colorado River, a breeding population on the California side was estimated at 180 pairs in 1977 (Gaines 1977). Additional pairs reside in the Sacramento and Owens valleys, along the South Fork of the Kern River in Kern County, along the Santa Ana River in Riverside County, and along the Amargosa River in Inyo and San Bernardino counties. The western yellow-billed cuckoo may also nest along San Luis Rey River in San Diego County. These birds were formerly much more common and widespread throughout lowland California, but numbers have been drastically reduced by habitat loss (Grinnell and Miller 1944, Garrett and Dunn 1981; Gaines 1974). Current population estimations show about 50 pairs existing in California (Hughes 1999).

This species was found near the Project Vicinity during the CNDDB search. The occurrences were found within the Nicolaus USGS quadrangle (CDFW 2015a).

3.2.5.3.9.4 Life History and Habitat Requirements

The western yellow-billed cuckoo is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California. The yellow-billed cuckoo is a slim, long-tailed bird about 12 in. in length and weighing about 60 grams (USFWS 2013b). Its broad, curved bill is yellow at the base of the lower mandible and black on top. The long tail is grayish brown above and strikingly marked with six white spots against a black background below.

Western yellow-billed cuckoos are insect specialists, but also prey on small vertebrates such as tree frogs and lizards (50 CFR 48551). This cuckoo breeds in riparian habitat along low gradient (i.e., surface slope <3%) rivers and streams, and in open riverine valleys that provide wide floodplain conditions (i.e., >325 ft). The moist conditions that support riparian plant communities that provide western yellow-billed cuckoo habitat typically exist in lower elevation, broad floodplains, as well as where rivers and streams enter impoundments (50 C.F.R. 48551).

3.2.5.3.9.5 Stressors and Limiting Factors

The loss and degradation of native riparian habitat throughout the western yellow-billed cuckoo's range have played a major role in the bird's decline. Residential development, ground-water pumping, agriculture, flood control, and non-native plant invasions all negatively alter the composition of the streamside forests these birds depend on. Pesticide use may also be harming western yellow-billed cuckoo populations. Reproduction problems caused by eggshell thinning have been documented in the western yellow-billed cuckoo, causing concern about pesticide loads for the species (USFWS 2013b).

3.2.5.4 Known or Potential Project Effects

Provided below is a list of known or potential Project effects on ESA-listed species and their critical habitats. The list was developed based on responses to SSWD's PAD Information Questionnaire and SSWD's current understanding of the issues.

- From Responses to SSWD's PAD Information Questionnaire:
  - Effects of Project O&M and associated recreation on reproduction, foraging, and migration of ESA-listed species (identified by Cal Fish and Wildlife).
  - Effects of Project O&M and associated recreation on ESA-listed fish species and their critical habitat (identified by NMFS and FWN).
  - Effects of Project O&M and associated recreation on ESA-listed species and their critical habitat (identified by Placer County).
- From SSWD
  - SSWD did not identify any known or potential Project effects on ESA-listed species and their critical habitat in addition to those identified by respondents to SSWD's PAD Information Questionnaire.

3.2.5.5 List of Attachments

This section includes one attachment:

- Attachment 3.2.5A - IPaC report. U.S. Fish and Wildlife Service. Camp Far West. IPaC Trust Resource Report. (1 Adobe PDF file: 500KB; 8 pages formatted to print on 8.5x11 paper)

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Threatened and Endangered Species
Attachment

- Attachment 3.2.5A - IPaC report. U.S. Fish and Wildlife Service. Camp Far West. IPaC Trust Resource Report. (1 Adobe PDF file: 500KB; 8 pages formatted to print on 8.5x11 paper)

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U.S. Fish & Wildlife Service

Camp Far West

IPaC Trust Resource Report

Generated August 25, 2015 02:36 PM MDT

US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

Camp Far West

PROJECT CODE

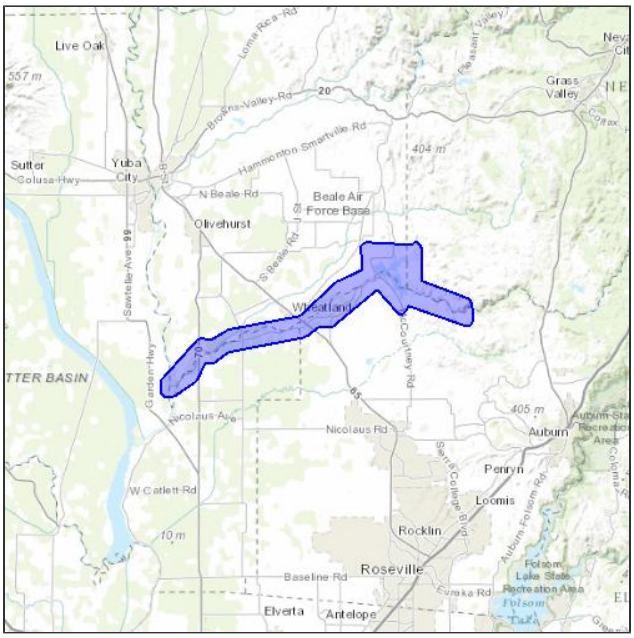
WHXAK-662EB-FTNDL-WBGTW-BS72SY

LOCATION

California

DESCRIPTION

No description provided



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Sacramento Fish And Wildlife Office
Federal Building
2800 COTTAGE WAY, ROOM W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

Amphibians

California Red-legged Frog Rana draytonii — **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D

Birds

Yellow-billed Cuckoo Coccyzus americanus — **Threatened**

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06R

Crustaceans

Conservancy Fairy Shrimp Branchinecta conservatio — **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K03D

Vernal Pool Fairy Shrimp Branchinecta lynchi — **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K03G

Vernal Pool Tadpole Shrimp Lepidurus packardi — **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K048

Fishes

Delta Smelt Hypomesus transpacificus **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070

Steelhead Oncorhynchus (=Salmo) mykiss **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D

Insects

Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I01L

Reptiles

Giant Garter Snake Thamnophis gigas **Threatened**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C057

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

Chinook Salmon Critical Habitat Final designated
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E06D#crithab

Steelhead Critical Habitat Final designated
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D#crithab

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Bald Eagle Haliaeetus leucocephalus — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Black Swift Cypseloides niger — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FW

Black Rail Laterallus jamaicensis — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A

Brewer's Sparrow Spizella breweri — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — **Bird of conservation concern**
Year-round

Calliope Hummingbird Stellula calliope — **Bird of conservation concern**
Season: Breeding

Costa's Hummingbird Calypte costae — **Bird of conservation concern**
Season: Breeding

Flammulated Owl Otus flammeolus — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DK

Fox Sparrow Passerella iliaca — **Bird of conservation concern**
Year-round

Green-tailed Towhee Pipilo chlorurus — **Bird of conservation concern**
Season: Breeding

Least Bittern Ixobrychus exilis — **Bird of conservation concern**
Season: Breeding

Lewis's Woodpecker Melanerpes lewis — **Bird of conservation concern**
Season: Wintering

Loggerhead Shrike Lanius ludovicianus — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S

Mountain Plover Charadrius montanus **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B078

Nuttall's Woodpecker Picoides nuttallii **Bird of conservation concern**
Year-round

Oak Titmouse Baeolophus inornatus **Bird of conservation concern**
Year-round

Peregrine Falcon Falco peregrinus **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU

Short-eared Owl Asio flammeus **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD

Snowy Plover Charadrius alexandrinus **Bird of conservation concern**
Season: Breeding

Swainson's Hawk Buteo swainsoni **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070

Tricolored Blackbird Agelaius tricolor **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06P

Williamson's Sapsucker Sphyrapicus thyroideus **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FX

Yellow-billed Magpie Pica nuttalli **Bird of conservation concern**
Year-round

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands identified in this project area