

3.3.5 Threatened and Endangered Species

This section discusses species listed as threatened or endangered species under the ESA, and refers to those species as ESA-listed. First, and immediately below, is a list and status of the studies YCWA conducted regarding threatened and endangered species. Second, Section 3.3.5.1 describes YCWA's actions to identify threatened and endangered species and their designated Critical Habitats that could potentially be affected by the proposed Project. Section 3.3.5.2 describes YCWA's consultation with USFWS and NMFS regarding ESA-listed species. Section 3.3.5.3 describes the Environmental Baseline for ESA-listed species under USFWS' jurisdiction (i.e., plant, invertebrate and amphibian species). Section 3.3.5.4 addresses Project effects on ESA-listed species under USFWS' jurisdiction. Section 3.3.5.5 summarizes the contents of YCWA's APDBA in Volume IV of this Amended FLA, which addresses ESA-listed species under NMFS' jurisdiction (i.e., anadromous fishes). Section 3.3.5.6 discusses measures recommended by agencies and NGOs.

To supplement the information in YCWA's PAD, YCWA conducted 12 studies to determine the potential effects of the Project on ESA-listed species: 1) Study 5.2, *Special-status Plants and Valley Elderberry Longhorn Beetles on Lands Affected by Construction of the Proposed New Flood Control Outlet at New Bullards Bar Dam*; 2) Study 7.1, *ESA-Listed Plants*; 3) Study 7.2, *Narrows 2 Powerhouse Intake Extension*; 4) Study 7.3, *ESA-Listed Amphibians – California Red-Legged Frog*; 5) Study 7.4, *ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle*; 6) Study 7.8, *ESA- and California ESA-Listed Salmonids Downstream of Englebright Dam*; 7) Study 7.9, *Green Sturgeon Downstream of Englebright Dam*; 8) Study 7.10, *Instream Flow Downstream of Englebright Dam*; 9) Study 7.11, *Fish Behavior and Hydraulics Near Narrows 2 Powerhouse*; 10) Study 7.11a, *Radio Telemetry Study of Spring- and Fall-run Chinook Salmon Downstream of Narrows 2 Powerhouse*; 11) Study 7.12, *Evaluation of Project Effects on Daguerre Point Dam and Hallwood-Cordua Fish Facilities*; and 12) Study 7.13, *Fish Stranding Associated with Shutdown of Narrows 2 Powerhouse Partial Bypass*. All of these studies are complete, and technical memoranda providing the study results are included in Appendix E6 of this Amended FLA.

Action Agency under ESA

For the purpose of ESA, FERC is considered the Action Agency. The FERC has designated YCWA as its non-federal representative for ESA consultation.

Proposed Action under ESA

For the purpose of ESA, the Proposed Action includes issuance by the Commission of a new license to YCWA for the continued O&M of the Project as it is described in Section 2 of this Exhibit E.

Action Area under ESA

An action area is defined as “*all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action*” (50 C.F.R. § 402.02). Direct effects are defined as “*the direct or immediate effects of the project on the species or its habitat*” (USFWS and NMFS 1998). Indirect effects are defined as “*those that are caused by the Proposed Action and are later in time, but still are reasonably certain to occur*” (50 C.F.R. § 402.02). The downstream extent of the action area is defined as the point where effects to river flow and habitat availability associated with the Proposed Action are no longer measurable (NMFS 2012).

Environmental Baseline under ESA

For the purpose of ESA, the Environmental Baseline includes the past and present impacts of all federal, state, or private activities, and other human activities in the action area, as well as the anticipated impacts of all proposed federal projects in the Action Area that have already undergone formal or early ESA Section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process (50 C.F.R. § 402.02). The Environmental Baseline includes effects attributable to the existence of dams or diversions over which the Action Agency (i.e., FERC) has no discretion, and non-discretionary operations and maintenance.

Proposed Action Effects under ESA

Under Section 7(a)(2) of the ESA, the federal action agency that permits, licenses, funds, or otherwise authorizes an action must consult with the NMFS and the USFWS, as appropriate, to ensure that the action will not jeopardize the continued existence of any ESA-listed species or adversely modify ESA-designated critical habitat, unless the federal action agency determines the action will have no effect on ESA-listed species (16 U.S.C. § 1536(c)).

If the federal agency determines the action may affect ESA-listed species or designated critical habitat, it is required to prepare a biological assessment (a BA) for the Section 7 process to determine whether the action is likely to: 1) adversely affect listed species or designated critical habitat; 2) jeopardize the continued existence of species that are proposed for listing;¹ or 3) adversely modify proposed critical habitat. After reviewing the BA, NMFS or USFWS determines whether formal consultation or a conference is necessary (50 C.F.R. § 402.02, 50 C.F.R. § 402.12).

When a federal action agency determines, through a BA or other review, that its action is not likely to adversely affect a listed species or designated critical habitat, the action agency must request the NMFS’ or the USFWS’, as appropriate, concurrence on its determination. A not likely to adversely affect determination is appropriate and warranted when the action agency

¹ “Jeopardize the continued existence of” under the ESA is defined as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species.” (50 C.F.R. § 402.02)

concludes that all of the effects of the action on the species and its critical habitat are expected to be “*insignificant*,” “*discountable*” or “*completely beneficial*.” According to the USFWS’ and NMFS’ *Endangered Species Consultation Handbook, Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act* (USFWS and NMFS 1998):

[i]nsignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

Further, page 4-32 of the ESA Consultation Handbook states that:

The Services can evaluate only the Federal action proposed, not the action as the Services would like to see that action modified.

If the NMFS or the USFWS, as appropriate, does not concur with the action agency’s determination of “not likely to adversely effect,” the action agency must request formal consultation or a conference. Similarly, when the action agency determines, through a BA or other review, that its action is “likely to adversely affect” a listed species or designated critical habitat, the action agency must submit a request for formal consultation to the NMFS or the USFWS, as appropriate.

There is a designated 90-day period for formal consultation to take place and, after that, another 45-day period for NMFS or USFWS, as appropriate, to prepare a biological opinion (i.e., a BO, also referred to at times as a BiOp). The ESA does not allow extension of the consultation period beyond 150 days without the applicant’s² consent (16 U.S.C. § 1536(b)(1)(B)).

The BO presents NMFS’ or USFWS’, as appropriate, determination as to whether or not the proposed action would be likely to jeopardize the species or adversely modify its critical habitat. If the NMFS or the USFWS, as appropriate, issues either a no jeopardy opinion or a jeopardy opinion that contains Reasonable and Prudent Alternatives (RPA), the BO may include an incidental take³ statement. NMFS or USFWS, as appropriate, must anticipate the quantity of take that may result from the action and authorize such take with a statement that the ESA-listed species described in the incidental take statement will not be jeopardized. The incidental take statement must contain clear terms and conditions designed to reduce the effect of the anticipated take; these terms are binding on the action agency.

² For this Project, the “*applicant*” is YCWA. For consultation regarding the DEIS or BA, the “*applicant*” is FERC.

³ “*Take*” is defined under the ESA to mean “*harass, harm, pursue, hunt, shoot would, kill, trap, capture or collect, or attempt to engage in any such conduct.*” (16 U.S.C. § 1532). “*Harm*” in the definition of “*take*” as used in the ESA means an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering (16 U.S.C. § 222.102).

Interrelated and Interdependent Actions under ESA

Interrelated actions are actions that are part of a larger action and depend on the larger action for their justification. Interdependent actions are actions having no independent utility apart from the proposed action. (50 C.F.R. § 402.02.) If a particular activity would not occur “*but for*” the occurrence of the proposed federal action, the effects of that action are interdependent and interrelated to the federal action, and the effects of that action are attributable to the federal action for consultation purposes. To the contrary, activities that would occur anyway, with or without the occurrence of the federal action at issue, are not interdependent or interrelated to the proposed federal action. The ESA Consultation Handbook (1998) further clarifies that if a project would exist independently of a proposed action, it cannot be considered “*interrelated*” or “*interdependent*,” even if the proposed action is required to bring the existing facility into compliance with federal law.

3.3.5.1 Identification of Potentially-Affected ESA-listed Species and Critical Habitat

YCWA identified ESA-listed species and ESA-designated Critical Habitat that could be affected by the proposed Project in three screening steps that occurred at different times in the relicensing process. Each of these screening steps and the final list of ESA-listed species and Critical Habitats are described below.

3.3.5.1.1 Initial Screening for Potentially-Affected ESA-listed Species

YCWA generated official lists of ESA-listed and candidate species for the Project Vicinity, which includes eight 7.5-minute USGS topographic quadrangles⁴ using the on-line request service available at USFWS’ website (http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm). The official list included nine species, one Distinct Population Segment (DPS) and two Evolutionary Significant Units (ESU). The species included one plant, two invertebrates, one amphibian, one reptile and four fishes.

- ESA Endangered Species:
 - Sacramento River winter-run Chinook salmon ESU
- ESA Threatened Species:
 - Layne’s ragwort (*Packera layneae*)
 - Valley elderberry longhorn beetle
 - Vernal pool fairy shrimp (*Branchinecta lynchi*)
 - California red-legged frog and Critical Habitat
 - Giant garter snake (*Thamnophis gigas*)

⁴ The Project Vicinity is encapsulated by the following USGS quadrangles: Challenge, Camptonville, French Corral, Smartsville, Clipper Mills, Strawberry Valley, Pike and Oregon House.

- California Central Valley steelhead DPS and Critical Habitat⁵
- Central Valley spring-run Chinook salmon ESU and Critical Habitat⁶
- Delta smelt (*Hypomesus transpacificus*)

YCWA eliminated from further consideration Delta smelt, Sacramento River winter-run Chinook salmon and giant garter snake because these species are not known to occur in the Project Vicinity.

YCWA searched several sources to compile the following for each of the ESA-listed species: 1) a description of the species' habitat requirements; 2) any known occurrences of the species in the Project Vicinity, and 3) references to any recovery plans or status reports pertaining to that species. The information sources included Cal Fish and Wildlife's CNDDDB, Forest Service's species occurrence database for the TNF (Forest Service 2009d), and USFWS' and NMFS' online database and recovery plans. For plants, the sources also included in the United States Department of Agriculture's PLANTS database and the CNPS' database, which were queried for the Project Vicinity, plus an additional buffer of one USGS topographic quadrangle.⁷

Based on these searches, YCWA added five additional species to the list of ESA-listed species that could potentially be affected by continued Project O&M: three plants, one invertebrate and one fish:

- ESA Endangered Species:
 - Stebbins' morning-glory (*Calystegia stebbinsii*)
 - Pine Hill flannelbush (*Fremontodendron decumbens*)
 - Hartweg's golden sunburst (*Pseudobahia bahiifolia*)
 - Vernal pool tadpole shrimp (*Lepidurus packardi*)
- ESA Threatened Species:
 - North American green sturgeon, southern DPS and Critical Habitat⁸

The results of YCWA's search are shown in Table 3.3.5-1.

⁵ The ESU for Central Valley 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 Feather River Fish Hatchery population. On the Yuba River, Critical Habitat for spring-run Chinook salmon extends from the confluence with the Feather River upstream to Englebright Dam.

⁶ The DPS for Central Valley steelhead includes all naturally-spawned populations of steelhead below natural and human-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. On the Yuba River, Critical Habitat for Central Valley steelhead extends from the confluence with the Feather River upstream to Englebright Dam.

⁷ YCWA re-queried Cal Fish and Wildlife's CNDDDB (Cal Fish and Wildlife 2017) and the Forest Service's special-status species lists (Forest Service 2013) January 26, 2017. No additional species were found in addition to the original list.

⁸ The Southern DPS of North American green sturgeon includes the green sturgeon population spawning in the Sacramento River and utilizing the Sacramento-San Joaquin River Delta and San Francisco Estuary. On the Yuba River, Critical Habitat for the Southern DPS of North American green sturgeon extends from the confluence with the Feather River upstream to Daguerre Point Dam.

Table 3.3.5-1. ESA-listed species occurring or potentially occurring in the Project Vicinity.

Species		Suitable Habitat Type	Known Occurrence in Project Vicinity	ESA Status ²	Status Reports and Recovery Plans Relevant to Project Vicinity
Common Name ¹	Scientific Name				
PLANTS					
Pine Hill flannelbush	<i>Fremontodendron californicum</i> ssp. <i>decumbens</i>	Chaparral, cismontane woodland/gabbroic or serpentinite, rocky (CNPS 2010).	Unknown in Project Vicinity.	FE	Recovery Plan (USFWS 2002a)
Layne's ragwort	<i>Packera layneae</i>	Chaparral, cismontane woodland, gabbro, serpentinite (CNPS 2010).	Four occurrences recorded with CNDDB in Project Vicinity; two occurrences are within the Challenge quad and two occurrences are within the Clipper Mills quad (CDFG 2012b).	FT	Recovery Plan (USFWS 2002a)
Stebbins' morning-glory	<i>Calystegia stebbinsii</i>	Chaparral, cismontane woodland (CNPS 2010).	Not known in Project Vicinity, occurs within Nevada County (CNPS 2010).	FE	Recovery Plan (USFWS 2002a)
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	Valley and foothill grassland, cismontane woodland (CNPS 2010).	Unknown in Project Vicinity.	FE	None
INVERTEBRATES					
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	Occurs only in the Central Valley and adjacent foothills up to 3,000 feet (ft) elevation in association with blue elderberry (<i>Sambucus nigra</i> ssp. <i>caerulea</i>) (CDFG 2012b).	Reported on the USFWS species list for Project Vicinity quads and counties (USFWS 2010c). Seven occurrences recorded with CNDDB near Project Vicinity within Browns Valley quad (CDFG 2012b).	FT	Recovery Plan (USFWS 1984)
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Endemic to grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains, in rain-filled pools (CDFG 2012b).	Reported on the USFWS species list for Project Vicinity quads and counties (USFWS 2010c). One occurrence recorded with CNDDB near Project Vicinity within Browns Valley quad at Beale Air Force Base (CDFG 2012).	FT	Recovery Plan (USFWS 2005a)
Vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water (CDFG 2012b).	Four occurrences recorded with CNDDB near Project Vicinity within Browns Valley quad (CDFG 2012); three occurrences at Beale Air Force Base, and one occurrence at Western Aggregates Gravel Mine on Hammonton Road in Yuba County.	FE	Recovery Plan (USFWS 2005a)
AMPHIBIANS					
California red-legged frog	<i>Rana draytonii</i>	Suitable habitat is located in deep (>0.7 meter), still or slow-moving water within dense, shrubby riparian and upland habitats (Jennings and Hayes, 1994).	Reported on the USFWS species list for Project Vicinity quads and counties (USFWS 2010d). One occurrence recorded with CNDDB within Challenge quad (CDFG 2012b).	FT	Recovery Plan (USFWS 2002b)

Table 3.3.5-1. (continued)

Species		Suitable Habitat Type	Known Occurrence in Project Vicinity	ESA Status ²	Status Reports and Recovery Plans Relevant to Project Vicinity
Common Name ¹	Scientific Name				
FISH					
Steelhead, California Central Valley DPS	<i>Oncorhynchus mykiss irideus</i>	Spawning occurs within the Sacramento and San Joaquin rivers and their tributaries (NatureServe 2008). Naturally-spawning populations that support anadromy have been found in the Yuba River below USACE's Englebright Dam (McEwen 2001).	Reported on the USFWS species list for Project Vicinity quads and counties (USFWS 2010c). No known occurrences recorded by CNDDDB in the Project Vicinity.	FT	Status Report (Busby et al. 1996; Ford 2011; Good et al. 2005; NMFS 1997; NMFS 1998a) Restoration and Management Plan (CDFG 1991; CDFG 1993b; CDFG 1996a) Recovery Plan (Draft) (NMFS 2014a) 5-year Status Review (NMFS 2016a)
Chinook salmon, Central Valley spring-run ESU	<i>Oncorhynchus tshawytscha</i>	Spawning occurs within the Sacramento River and its tributaries (NatureServe 2008). Naturally-spawning anadromous Chinook salmon expressing the phenotypic characteristics of spring-run have been observed in the lower Yuba River below USACE's Englebright Dam (McEwen 2001).	Reported on the USFWS species list for Project Vicinity quads and counties (USFWS 2010c). One occurrence recorded by CNDDDB within the Smartsville quad; Yuba River from Highway 20 Bridge upstream to USACE's Englebright Dam (CDFG 2012b).	FT	Status Report (CDFG 1996b; CDFG 1998b; Ford 2011; Good et al. 2005; NOAA and NMFS 1998b; NMFS 1999) Restoration and Management Plan (CDFG 1991; CDFG 1993b) Recovery Plan (Draft) (NMFS 2014a) 5-year Status Review (NMFS 2016)
North American green sturgeon, southern DPS	<i>Acipenser medirostris</i>	In the Sacramento river system, spawning occurs predominantly in the upper Sacramento River above Hamilton City and perhaps as far upstream as Keswick Dam (NatureServe 2008).	Only known spawning habitat near the Project Vicinity is on the Sacramento River (YCWA 2007). No known occurrences recorded by CNDDDB or USFWS. Confirmed occurrence of green sturgeon below USACE's Daguerre Point Dam in the lower Yuba River (NMFS 2008, Cramer 2011).	FT	Status Report (Adams et al. 2002; NMFS 2005) 5-year Status Review (NMFS 2015)

¹ DPS = distinct population segment
ESU = evolutionarily significant units

² Status:
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.

3.3.5.1.2 Second Screening for Potentially-Affected ESA-listed Species

On June 6, 2013, YCWA updated the February 24, 2010 official list of ESA-listed species using the USFWS’ website (same USGS topographic quadrangles used in the first screening) and found that the North American green sturgeon, southern DPS was not included on the updated list. Nevertheless, YCWA did not remove North American green sturgeon from its list of potentially-affected ESA-listed species.

3.3.5.1.3 Third Screening for Potentially-Affected ESA-listed Species

YCWA re-queried for ESA-listed and candidate species on January 26, 2017, using the USFWS’ Information for Planning and Conservation search (USFWS 2017a). The search included the proposed FERC Project Boundary. Only one species was identified in addition to the original official ESA list: Sierra Nevada yellow-legged frog (*Rana sierrae*). However, this species was eliminated from further consideration because the lower limit of its known range is 4,400 ft, well above the proposed Project, and there are no known records of the species occurring in the Project Vicinity.

3.3.5.1.4 Final List of Potentially-Affected ESA-listed Species

Based on the above screening process, YCWA concluded that 11 ESA-listed species have a potential to be affected by the Project, although the presence of suitable habitat for some of these species had not been confirmed (Table 3.3.5-2).

Table 3.3.5-2. ESA-listed species that have a potential to be affected by the Project.

Species		Potential to be Affected by the Project
Common Name	Scientific Name	
Layne’s ragwort	<i>Packera layneae</i>	Potential, but area is outside of the known range of the species.
Hartweg’s golden sunburst	<i>Pseudobahia bahiifolia</i>	Limited to Mima mounds, which may not be present or affected by the Project.
Pine Hill flannelbush	<i>Fremontodendron californicum</i> ssp. <i>decumbens</i>	Potential, but area is outside of the known range of the species.
Stebbins’ morning-glory	<i>Calystegia stebbinsii</i>	Potential within suitable habitat.
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	Potential, if the host species (elderberry) is present in areas affected by the Project.
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Potential, but limited to seasonal pools in areas affected by the Project.
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	Primarily limited to large vernal pools, which may not be present or affected by the Project.
California red-legged frog	<i>Rana draytonii</i>	Potential, with historical occurrences in Project Vicinity.
Steelhead, California Central Valley distinct population segment (DPS)	<i>Oncorhynchus mykiss irideus</i>	Potential, with current occurrences in Project Vicinity.
Chinook salmon Central Valley spring-run evolutionary significant unit (ESU)	<i>Oncorhynchus tshawytscha</i>	Potential, with current occurrences in Project Vicinity.
North American green sturgeon, Southern DPS	<i>Acipenser medirostris</i>	Potential, with current occurrences in Project Vicinity.

3.3.5.2 Consultation with USFWS, NMFS and Other Relicensing Participants

Beginning in July 2009, YCWA began to meet with Relicensing Participants to familiarize them with the Project and its operations, to discuss process, identify issues, and most importantly, to collaboratively develop study proposals, including for ESA-listed species. Since that time, YCWA has held over 150 meetings with Relicensing Participants to discuss process, study methods and results. The USFWS and NMFS were each specifically notified of and invited to each meeting, and both agencies have participated in some of the meetings during which ESA related items were discussed. The following includes YCWA's record of the consultation process.

1. August 31, 2009. Larry Thompson (NMFS) was present for the communication guidelines meeting held by YCWA where agencies and other Relicensing Participants agreed to meeting to discuss relicensing communication guidelines.
2. October 1, 2009. YCWA offered a Project Tour to familiarize for agencies, tribes and NGOs with the Project on the ground. Larry Thompson (NMFS) was present for the meeting.
3. September 29, 2009. YCWA provided to USFWS and NMFS a Preliminary Information Package.
4. November 5, 2010. YCWA provided to USFWS and NMFS a PAD (YCWA 2011), which included a copy of proposed Study 7.1, *ESA-Listed Plants*; Study 7.3, *ESA-Listed Amphibians - California Red-Legged Frog (CRLF)*; Study 7.4, *ESA-Listed Wildlife - Valley Elderberry Longhorn Beetle (VELB)*; Study 7.8, *ESA- and California ESA-Listed Salmonids Downstream of Englebright Dam*, and Study 7.9, *Green Sturgeon Downstream of Englebright Dam*.
5. March 7, 2011. USFWS responded to YCWA's November 2010 Proposed Study Plans, but did not make any comments on or suggest modifications to the studies.
6. March 7, 2011. NMFS responded to YCWA's November 2010 PAD, but deferred comment on the Proposed Study Plans.
7. May 24, 2010. Rick Wantuck (NMFS) attended the third study proposal development meeting regarding anadromous fishes, ESA/CESA Species & non-ESA-listed fish below Englebright Dam.
8. May 4, 2011. Larry Thompson and John Wooster (NMFS) participated by phone in the Relicensing Participants meeting regarding the new studies proposed by USFWS and FWN.
9. May 11, 2011. Larry Thompson and John Wooster (NMFS) attended the Relicensing Participants meeting regarding FERC required proposed study plan meeting.
10. May 19, 2011. Section 7 Consultation Meeting. The following NMFS representatives participated in the meeting with YCWA and FERC: Maria Rea, Rod McInnis, Rick Wantuck, Larry Thompson, Howard Brown, Steve Edmondson, and Gary Sprague.

11. June 1, 2011. Gary Sprague (NMFS) attended a NMFS, FERC and YCWA Section 7 informal consultation meeting.
12. June 3, 2011. John Wooster (NMFS) was present for the Relicensing Participants Meeting to continue 5/11 discussion of channel morphology study proposals.
13. June 6, 2011. Gary Sprague (NMFS) attended a NMFS, FERC and YCWA Section 7 informal consultation meeting.
14. June 17, 2011. Gary Sprague, Larry Thompson, Rick Wantuck and John Wooster (NMFS) participated in the Relicensing Participants Meeting to discuss NMFS' Study Requests and FWN's Anadromous Fish Passage Study Request.
15. July 12, 2011. Gary Sprague and Rick Wantuck (NMFS) attended a NMFS, FERC and YCWA Section 7 informal consultation meeting.
16. July 18, 2011. USFWS submitted comments on Scoping Document 2 and YCWA's Proposed Study Plan and made two suggested modifications to Study 7.3, which were adopted.
17. July 18, 2011. NMFS submitted comments on YCWA's Proposed Study Plans, including Study 7.8 and Study 7.9.
18. August 5, 2011. NMFS / FERC / YCWA Section 7 Informal Consultation Meeting.
19. August 12, 2011. NMFS / FERC / YCWA Section 7 Informal Consultation Meeting.
20. September 1, 2011. NMFS responded to YCWA's August 17, 2011 Revised Study Plan, but did not comment on any of the studies.
21. September 1, 2011. USFWS responded to YCWA's August 17, 2011 Revised Study Plan and commented on Study 7.8 and 7.9.
22. October 20, 2011. NMFS issued a dispute letter to FERC's September 30, 2011 Study Determination.
23. December 13, 2011. YCWA participated in a conference with FERC's and NMFS' staffs in an effort to resolve some of the NMFS' disputes.
24. April 20, 2012. Gary Sprague and Rick Wantuck (NMFS) attended a NMFS, FERC and YCWA Section 7 informal consultation meeting.
25. July 12, 2012. FERC, NMFS and YCWA conducted an additional informal meeting to discuss the BA and EFH assessment.
26. October 22, 2012. FERC, USFWS and YCWA met to discuss the potential for Project effects related to ESA-listed plants, CRLF and VELB. USFWS said it believed additional data gathering was not necessary, but would consider and advise YCWA in mid-November 2012.
27. November 8, 2012. USFWS advised YCWA that USFWS had not come to a decision regarding potential Project effects on listed plants and amphibians. During this meeting, USFWS advised YCWA that it concluded additional data collection related to VELB was not necessary.

28. December 3, 2012. YCWA submitted the Initial Study Report (ISR) for the Project. At the time, only Study 7.4 was complete. YCWA provided interim technical memoranda for all additional FE and FT species' studies.
29. December 3, 2012. USFWS said it was in the process of completing its internal review of the September 2012 Interim Technical Memoranda 7.1, *ESA-Listed Plants*, and 7.3, *ESA-Listed Amphibians – CRLF*, and consulting with other agencies. YCWA and USFWS agreed that for the purpose of the FERC-approved study, consultation would be considered complete. However, YCWA and USFWS agreed that consultation would continue under both FERC's Integrated Licensing Process (ILP) and Section 7 of the ESA. Under the ILP, consultation regarding additional data gathering could occur both formally (i.e., through the ILP ISR process), and informally (i.e., YCWA and USFWS could continue discussions of potential additional data gathering, if the parties believed there was a benefit in doing so).
30. January 28, 2013. NMFS issued comments on YCWA's ISR, including comments on studies 7.8 and 7.9.
31. January 29, 2013. USFWS issued comments on YCWA's ISR, including comments on studies 7.1, 7.3, and 7.8.
32. May 17, 2013. YCWA and USFWS agreed on the next steps in addressing CRLF status in the Project Area, which included a site visit together on July 11, 2013 to view wetland sites in the vicinity of Little Oregon Creek and staging areas for New Bullards Bar Reservoir woody debris disposal near Moran Cove. The field trip was attended by USFWS and Forest Service representatives and included a night survey of a site with previous observations of CRLF. A trip report was provided to FERC. A follow-up meeting was scheduled for September 26. YCWA and USFWS also agreed that Technical Memorandum 7-3, *ESA-Listed Amphibians - CRLF*, can now be considered final.
33. July 3, 2013. USFWS filed with FERC a request for a new study in support of YCWA's Yuba River Development Project.
34. July 3, 2013. YCWA provided Draft Study 7-11a, Radio Telemetry Study of Spring-and Fall-run Chinook Salmon Migratory Behavior Downstream of Narrows 2 Powerhouse to NMFS, USFWS, and Cal Fish and Wildlife for review and written comment. YCWA received written comments from NMFS and USFWS.
35. September 26, 2013. Tom Holley, Larry Thompson and John Wooster (NMFS) were present for the YCWA Relicensing Study 7.11a *Telemetry* Technical Review.
36. September 26, 2013. YCWA, USFWS and Forest Service met to discuss CRLF. The agencies discussed woody debris management at New Bullards Bar Reservoir and asked that YCWA provide more details at a future Relicensing Participant meeting, specifically in regards to how debris would be handled if it exceeded the capacity of the current staging site. The agencies also discussed whether additional information is needed on American bullfrog at New Bullards Bar Reservoir.
37. October 2, 2013. YCWA conducted a conference call simultaneously with an online meeting with agencies present for the meeting (government shutdown was in progress at

- the time the meeting was scheduled). YCWA and agencies present discussed agencies' redline of Bald Eagle Management Plan.
38. January 9, 2014. Elizabeth Campbell (USFWS) was present to discuss selection of the telemetry system in support of Study 7.11a, *Radio Telemetry Study of Spring-and Fall-Run Chinook Migratory Behavior Downstream of Narrows 2 Powerhouse*.
 39. January 31, 2014. YCWA posted Interim Technical Memorandum for Studies 7.11, *Fish Behavior and Hydraulics*, and 7.11a. *Radio Telemetry*.
 40. February 28, 2014. YCWA posts Technical Memorandum 7.13, *Fish Stranding Below Narrows 2 Powerhouse*.
 41. March 3, 2014. NMFS filed its comments on YCWA's DLA.
 42. March 3, 2014. USFWS filed its comments on YCWA's DLA. At pages 11 and 18, USFWS requested formal ESA consultation regarding Project effects on CRLF, and at pages 15 and 18, USFWS stated informal consultation is needed regarding Project effects on VELB.
 43. March 11, 2015. FERC-led study plan meeting/conference call to discuss if Telemetry study is possible in 2015 conditions.
 44. August 27, 2015. FERC called a study plan meeting to discuss Study 7.11a, *Radio Telemetry Study of Spring- and Fall-Run Chinook Salmon Migratory Behavior Downstream of Narrows 2 Powerhouse*. YCWA wished to discuss the status of the study's implementation.
 45. October 31, 2016. YCWA filed the Technical Memorandum for *Special-Status Plants and VELB Surveys on Lands Affected by Construction on the Proposed New Flood Control Outlet at New Bullards Bar Dam*.
 46. January 13, 2016. YCWA discussed Relicensing Participants' redlines of Conditions TE1 and TE2 (*Temperature and Salmonid Monitoring Below Englebright*) and TE3 (*Anadromous Fish Ecological Group*); and Discuss Narrows 2 Fish Stranding during the Relicensing Participants meeting. Allison Willy (USFWS) was present.
 47. February 23, 2016. Relicensing Participants followed up from the January 26, 2016, meeting on Our House and Log Cabin Entrainment and Fish Passage Mitigation Options. No agency attendance recorded.
 48. March 25, 2016. Relicensing Participants discussed Entrainment Options Table. Philip Choy (SWRCB), Beth Lawson (CDFW), Anna Milloy (CDFW), and Dennis Smith (USFS) were present.
 49. March 31, 2016: YCWA filed Technical Memorandum with FERC for Studies 7.11 and 7.11a.
 50. May 6, 2016. Deadline for Relicensing Participants to file comments on Technical Memorandum 7-11/7-11a.
 51. May 31, 2016. YCWA had discussions to reach agreement at staff level on outstanding potential 4e issues (Lohman Ridge Fish Screen, Our House Fish Ladder, Camptonville

Entrainment Monitoring, and Lohman Ridge Tunnel Closure. Philip Choy (SWRCB), Sean Hoobler (CDFW), Amy Lind (USFS), Carol Purchase (USFS), Dan Teater (USFS), and Allison Willy (USFWS) were present.

- 52. June 8, 2016. YCWA had discussions to reach agreement at management level on outstanding potential 4e issues (Lohman Ridge Fish Screen, Our House Fish Ladder, Camptonville Entrainment Monitoring, and Lohman Ridge Tunnel Closure).
- 53. July 11, 2016. Agencies and YCWA Management meeting to discuss Lohman Ridge Screen, Our House Ladder, Log Cabin Entrainment Monitoring, and Lohman Ridge Tunnel Closure.

Based on these meetings, discussions and documents, YCWA concluded that it would prepare for inclusion in the Amended FLA an APDBA addressing steelhead, spring-run Chinook salmon and North American green sturgeon – the ESA-listed species under NMFS’ jurisdiction. To reduce duplication, where applicable in this Section 3.3.5, YCWA refers to the APDBA, which is provided in Volume IV of this Amended FLA. YCWA concluded that ESA-listed species under USFWS’ jurisdiction could be addressed in the Amended FLA directly (i.e., a separate APDBA is not needed for those USFWS-jurisdictional species).

3.3.5.3 Environmental Baseline for ESA-listed Species Under USFWS’ Jurisdiction

This section describes the Environmental Baseline for: 1) ESA-listed plants; 2) VELB; 3) ESA-listed branchiopods (vernal pool fairy shrimp and vernal pool tadpole shrimp); and 4) CRLF. Information regarding current and historical distribution of the species in the region, status and Critical Habitat in the region, and life history is provided. In addition, the results of YCWA’s studies with regard to the presence and distribution of each species and its Critical Habitat, if any, in the area of the Project is also provided below. Information regarding YCWA’s relicensing studies applicable to general discussion of the Affected Environment is presented in Section 3.3.3 of this Exhibit E.

3.3.5.3.1 ESA– Listed Plant Species

Based on the reviews discussed above, YCWA identified four ESA-listed plants that have a reasonable potential to occur within the existing FERC Project Boundary: Stebbins’ morning-glory, Pine Hill flannelbush, Layne’s ragwort and Hartweg’s golden sunburst. Pertinent information, including life history information, is briefly summarized for each of the four ESA-listed plant species in Table 3.3.5-3.

Table 3.3.5-3. ESA-listed plant species potentially occurring in the vicinity of YCWA’s Yuba River Development Project.

Species		ESA Status ¹	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ²
Common Name	Scientific Name					
Stebbins’ morning-glory	<i>Calystegia stebbinsii</i>	FE	Apr-Jul	607-2,395	Chaparral, cismontane woodland	Unknown in Project Vicinity; present in Pilot Hill, Grass Valley and Lake Combie quads

Table 3.3.5-3. (continued)

Species		ESA Status ¹	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ²
Common Name	Scientific Name					
Pine Hill flannelbush	<i>Fremontodendron californicum</i> ssp. <i>decumbens</i>	FE	Apr-Jul	1,394-2,493	Chaparral, cismontane woodland/gabbroic or serpentinite, rocky	Unknown in Project Vicinity; present in Grass Valley quad
Layne's ragwort	<i>Packera layneae</i>	FT	Apr-Aug	656-3,281	Chaparral, cismontane woodland/serpentinite or gabbroic, rocky	Known in Project Vicinity in Challenge and Clipper Mills quad; also present in Pilot Hill and Rackerby quads
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	FE	Mar-Apr	50-500	Valley and foothill grassland, cismontane woodland	Unknown in Project Vicinity

¹ Status:

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.

² Occurrence in Project Vicinity: Some of the USGS topographic quadrangles are found entirely within the Project Vicinity and some are partially within the Project Vicinity. Results are based on CNPS nine-quadrangle search.

Stebbins' Morning-Glory⁹



Status and Critical Habitat

On October 18, 1996, the USFWS listed Stebbin's morning-glory as an endangered species under the ESA (Federal Register 61:54346). No Critical Habitat has been designated for this species. A 5-year review process was initiated in 2009 (USFWS 2017b).

Recovery Plan

USFWS issued a Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills for Stebbins' morning-glory and five other plant species that occur exclusively or primarily on gabbro soils in chaparral and woodland in the Central Sierra Nevada foothills in California

(USFWS 2002a).

Current and Historical Distribution

Five small occurrences of this plant are known in the Grass Valley quadrangle southwest of Grass Valley - four near McCourtney Road and one near Ponderosa Way (CDFG 2009d). In addition, Wilson (1986) reported other occurrences discontinuously scattered within two population centers in the northern and southern portions of the Pine Hill formation. Both the Grass Valley and Pine Hill occurrences are in gabbro or serpentine soils.

This species has not been located within the Project Vicinity. The nearest populations are in Grass Valley (CDFG 2009d).

Life History and Habitat Requirements

Stebbins' morning-glory is a leafy herbaceous perennial (i.e., a plant persisting or living for several years with a period of growth each year) with trailing to climbing stems. The leaves of Stebbins' morning-glory are 0.2 – 2 in long and palmately lobed into seven to nine narrow lobes.

⁹ Photo source: <http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0502+0654>.

Its creamy yellow flowers, which are sometimes tinged with pink, are bell shaped and grow up to about 1.5 in long (Brummit 2012). Stebbins' morning-glory occurs in chaparral habitats with gabbro or serpentine soils.

Stressors and Limiting Factors

The USFWS cites habitat loss and fragmentation, and fire suppression as the most significant threats to Stebbins' morning-glory. In addition, a majority of the occurrences are located on private land where the plant is unprotected (USFWS 2002a).

Pine Hill Flannelbush¹⁰

Status and Critical Habitat

On October 18, 1996, the USFWS listed Pine Hill flannelbush as an endangered species under the ESA (Federal Register 61:54346). No Critical Habitat has been designated for this species. A 5-year review process was initiated in 2009 (USFWS 2017b).



Recovery Plan

On December 11, 2002, USFWS issued a Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills for Pine Hill flannelbush and five other plant species that occur exclusively or primarily on gabbro soils in chaparral and woodland in the Central Sierra Nevada foothills in California (USFWS 2002a).

Current and Historical Distribution

The species is known only from one localized area near Pine Hill in western El Dorado County, scattered within an area of approximately 5,000 acres (ac). Although there are some reports of Pine Hill flannelbush occurring in some small scattered populations in Yuba and Nevada counties, other reports describe these individuals as aberrant California flannelbush (*Fremontodendron californicum* ssp. *californicum*). Most occurrences of Pine Hill flannelbush are on private land. One occurrence is on public land administered by the BLM, and one occurrence is on Cal Fish and Wildlife and California Department of Forestry and Fire Protection (CALFIRE) lands (CDFG 2009d). Presently, the majority of the Pine Hill flannelbush individuals are located on the parcel managed by CAL FIRE on Pine Hill and a nearby private parcel (USFWS 2002a).

This plant has not been found within the Project Vicinity. The nearest known population is in Grass Valley (CDFG 2009d).

Life History and Habitat Requirements

Pine Hill flannelbush is a small evergreen shrub less than 3.5 ft in height. The soft to leathery leaves of Pine Hill flannelbush are 0.5 – 2 in long and palmately lobed (lobing radiating from a common point); the orange flowers are 1 – 2 in wide, and the fruits generally require fire to release seeds (Lloyd 2012).

¹⁰ Photo source: <http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0507+0424>.

Pine Hill flannelbush occurs on scattered rocky outcrops in chaparral on and in the vicinity of Pine Hill and in the black oak (*Quercus kelloggii*) woodland on Pine Hill (USFWS 2002a). Community associates are ponderosa pine (*Pinus ponderosa*), foothill pine (*Pinus sabiniana*), chamise (*Adenostoma fasciculatum*), toyon (*Heteromeles arbutifolia*) and bigberry manzanita (*Arctostaphylos glauca*) (Kelman 1991; Boyd 1996).

Stressors and Limiting Factors

The USFWS cites habitat loss and fragmentation as the most significant threat to Pine Hill flannelbush. The conversion of wild lands to residential and commercial properties has both fragmented and altered available habitat (USFWS 2002a).

Layne's Ragwort



Status and Critical Habitat

On October 18, 1996, the USFWS listed Layne's ragwort as a threatened species under the ESA (63 Federal Register [FR] 49002). No Critical Habitat has been designated for this species. A 5-year review process was initiated in 2009 (USFWS 2017b).

Recovery Plan

On December 11, 2002, USFWS issued a Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills for Layne's ragwort and five other plant species that occur exclusively or primarily on gabbro soils in chaparral and woodland in the Central Sierra Nevada foothills in California (USFWS 2002a).

Current and Historical Distribution

CNDDDB reports Layne's ragwort occurrences within the Project Vicinity in the Rackerby, Challenge and Clipper Mills quads. Known occurrences of Layne's ragwort in the Challenge quadrangle include one population 0.6 mi west of upper New Bullards Bar Reservoir and one population east of Indian Creek. Known occurrences of Layne's ragwort in the Clipper Mills quadrangle include two populations; one 2 mi northeast of Woodleaf and one 0.7 mi south of Woodleaf (CDFG 2009c).

Historically, Layne's ragwort occurrences are most known within a 40,000-ac area in western El Dorado County that includes the Pine Hill formation and adjacent serpentine. In addition, a few other colonies occur in the Eldorado National Forest in El Dorado County, in the BLM Red Hills Area of Critical Environmental Concern in Tuolumne County, and on BLM managed land in Yuba County (USFWS 2002a).

Life History and Habitat Requirements

Layne's ragwort is a perennial herb of the aster family (Asteraceae) and grows to approximately 1 to 3 or more ft tall (Baldwin et. al 2012). It has mostly basal leaves that are 3 to 10 in long and flower heads with a width of 2 to 3 in. The flowers are yellow to orange with each flower head having five to eight ray flowers (the flowers usually located on the edge of the flower head) and numerous disk flowers (flowers in the center portion of the flower head) (USFWS 2002a).

Layne's ragwort grows in open rocky areas of gabbro and serpentine soils within chaparral plant communities. Gabbro soils originate from volcanic rocks (gabbrodiorite) that are mildly acidic, rich in iron and magnesium, and often contain other heavy metals, such as chromium. Gabbro, a large dark coarse-grained rock, is formed when liquid magma cools slowly underground. A red soil is formed when the rock is exposed and weathers at the earth's surface. These soils are well drained and are underlain by gabbrodiorite rocks at a depth of more than 3 ft. Serpentine-derived soils are formed through a process similar to formation of gabbro soils. Serpentine soils are derived from serpentinite, dunite and peridotite. They tend to have high concentrations of magnesium, chromium and nickel, and low concentrations of calcium, nitrogen, potassium and phosphorus. Most plants do not grow well on gabbro or serpentine soils (USFWS 2002a).

Stressors and Limiting Factors

The USFWS cites habitat loss and fragmentation as the most significant threat to Layne's ragwort. Historically, gold rush and agriculture activities reduced and fragmented habitat in western El Dorado County. More recently, commercial and residential development and road construction have increased fragmentation and caused changes to vegetation patterns in Layne's ragwort habitat (USFWS 2002a).

Hartweg's Golden Sunburst¹¹



Status and Critical Habitat

On February 6, 1997, the USFWS listed Hartweg's golden sunburst as an endangered species under the ESA (Federal Register 62:5542). No Critical Habitat has been designated for this species. A 5-year review for the species was completed by USFWS in December 2007 with no change in designation recommended (USFWS 2010b).

Recovery Plan

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

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 2001a).

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).

¹¹ Photo source: <http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+1207+0492>.

Hartweg's golden sunburst occurs in open grasslands and grasslands at the margins of blue oak (*Quercus douglasii*) 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 10 to 100 ft in diameter at the base, interspersed with basins that may pond water in the rainy season (USFWS 2001a).

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.

YCWA's Relicensing ESA-Listed Plant Study

YCWA performed botanical surveys for the four target ESA-listed plants and other plants within the existing FERC Project Boundary. The surveys began on March 26, 2012 and concluded by July 29, 2012. A total of 1,936 ac was surveyed. On May 13 and June 13, 2014, YCWA surveyed 2.5 miles of Garden Valley Road and two unnamed spur roads which had been added to the FERC Project Boundary. Additionally, on March 30, 2015, YCWA surveyed an additional 22.4 ac as part of the proposed new flood control outlet at New Bullards Bar. In conformance with the FERC-approved study, the surveys followed Cal Fish and Game's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009c); they were floristic in nature and conducted by foot and boat.

Although 698 plant species were found during floristic surveys between 2012 and 2015, no occurrences of ESA-listed plants were located. In addition, YCWA's field teams performing other relicensing studies from 2009 through 2016, did not record any incidental observations of ESA-listed plant species.

3.3.5.3.2 ESA-Listed Invertebrates

Valley Elderberry Longhorn Beetle¹²



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.

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 (USFWS 2006). In October of 2012, the USFWS began the process of reviewing the delisting proposal (USFWS 2012). In 2014, the USFWS

¹² Photo source: <<https://instruct1.cit.cornell.edu/courses/icb344/abstracts/valley-elderberry-beetle.htm>>.

withdrew the proposal to delist the species because the threats to the species and its habitat have not been reduced to the point where the species no longer meets the statutory definition of an endangered or threatened species (USFWS 2017b).

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 27 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, Santa Clara, Shasta, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Yolo and Yuba (USFWS 2017b).

VELB was not reported from the Project Vicinity. Seven occurrences have been recorded in Browns Valley (CDFG 2009c).

Life History and Habitat Requirements

The VELB is dependent on its host plant, elderberry, 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 (USFWS 2009a). 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 one to two 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.¹³ 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 metamorphosis, and then emerges from the chamber through the exit hole¹⁴ (USFWS 2009a).



Adults generally emerge from late-March through June and are short-lived; however, most records for adults occur from late-April to mid-May (USFWS 2009a). Adults feed on elderberry leaves and mate within the canopy.

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:

¹³ Frass is the debris or excrement produced by the insect.

¹⁴ Photo source: <http://www.riverpartners.org/news-and-events/newsletters/201009_VELB.html>.

- 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

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 2009a).

VELB also contend with invasive species, such as the Argentine ant and European earwig (*Forficula auricularia*), as these species prey on VELB larva. 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.

YCWA's Relicensing VELB Study

YCWA conducted a pre-literature review prior to field surveys to: 1) identify all possible VELB or VELB habitat in the study area; 2) identify locations where VELB or VELB habitat was previously observed, and 3) gather life history information for VELB.

To identify VELB or VELB habitat in the study area, YCWA searched for recorded occurrences of ESA-listed species using queries of the CNDDDB (CDFG 2012b). YCWA found no records of VELB within or adjacent to the study area.

Surveys for elderberry plants followed the Cal Fish and Game's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009c). Surveyors examined elderberry plants for evidence of VELB presence. The study included the area surrounding all Project facilities within the FERC Project Boundary. In addition, the survey area for Garden Valley Road in 2014 and the flood control outlet in 2015, described in Section 3.3.3.5.3.1, were surveyed for elderberry shrub and VELB presence.

The field surveys conducted by YCWA located one elderberry plant on land managed by the Sierra Foothill Research and Extension Center, University of California. The elderberry bush was found in a non-riparian community dominated by annual grasses and blue oak. It is approximately 20 ft from the northeast edge of the Narrows 2 Powerhouse access road and separated from the road by a fence. Surveyors reported eight stems, two having a diameter of 3.5 in at the ground and six that were less than 3 in. VELB indicators (i.e., boreholes) were not observed.

3.3.5.3.3 ESA-Listed Branchiopods

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp



Status and Critical Habitat^{15,16}

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

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).

A five-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 five-year review was initiated on May 25, 2011 (76 FR 30377).

Recovery Plan

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

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.

¹⁵ Photo source: <http://www.fws.gov/cno/es/images/Graphics/VPFS_5-yr%20review%20CNO%20FINAL%2027Sept07.pdf>.

¹⁶ Photo source: <http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0102+0261>.

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 1978). 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 2005a).

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).

This species was found near the Project Vicinity during the CNDDDB search. All occurrences were found within the Browns Valley quad (CDFG 2012b). Three occurrences were found at Beale Air Force Base and one occurrence was found at Western Aggregates Gravel Mine on Hammonton Road in Yuba County, near Beale Air Force Base (CDFG 2012b). Beale Air Force Base is within the Project Vicinity. Although Beale Air Force Base is known for its vernal pools, USFWS has excluded it from a Critical Habitat designation (68 FR 46684).

Listed fairy shrimp and tadpole shrimp were included in this section because there were occurrences in or near the Project Vicinity (e.g., Beale Air Force Base). However, there are no vernal pools in the FERC Project Boundary, and no potential for these species to occur where they would be affected by the Project.

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 (USFWS 2009b). 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.

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 degrees Celsius (°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, dissolved oxygen 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.

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 2009b).

3.3.5.3.4 ESA – Listed Amphibians

California Red-Legged Frog¹⁷



Status and Critical Habitat

The CRLF was listed as a threatened species on May 23, 1996 (61 FR 25813).

Critical Habitat was originally designated for CRLF on March 13, 2001 and redesignated 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 criteria for the CRLF Critical Habitat are: a) suitable aquatic habitat; b) associated uplands, and c) suitable dispersal habitat connecting suitable aquatic habitat (Allen and Tennant 2000; USFWS 2005b). 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.

Recovery Plan

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

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 and one each in the adjacent counties of Butte and Nevada.

According to the CRLF Recovery Plan (USFWS 2002b), 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 [*Lithobates catesbeianus*], crayfish [*Procambarus clarkii* and *Pacifastacus leniusculus*], and non-native predatory fish, such

¹⁷ Photo source: <http://calphotos.berkeley.edu/imgs/512x768/0000_0000/1201/0035.jpeg>.

as smallmouth bass [*Micropterus dolomieu*] and mosquitofish [*Gambusia affinis*]). In an experiment, the presence of American bullfrog tadpoles significantly lowered survival of CRLF tadpoles to metamorphosis (Lawler et al. 1999), probably through competition.

There was one recorded occurrence of CRLF in the Project Vicinity; this was in the Challenge USGS quadrangle.

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 (up to 200 ft from) riparian areas (Jennings and Hayes 1994; 71 FR 19244). During wet periods, long distance dispersal of up to a mile 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 1997).

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 (i.e., freshwater sunfishes), 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 in the Sierra Nevada 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 (Allen and Tennant 2000). 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).

Stressors and Limiting Factors

CRLF populations declined historically because of over-harvesting for food, loss of habitat and introduction of non-native species that prey upon or compete with CRLF. Loss and degradation of existing habitat from urban development, agriculture, mining, and water developments are also on-going threats to recovery. Because CRLF populations have been extirpated from large portions of the species' historical range, the continued survival of isolated populations, some of which are not within dispersal distance of other suitable habitats, is uncertain. Other factors that may limit recovery include contamination from agrochemicals, which may be wind-borne over long distances, and diseases, such as chytrid fungus and ranavirus (Tatarian and Tatarian 2010).

YCWA's Relicensing CRLF Study

In 2011 and 2012, YCWA conducted a data review for recorded occurrences of CRLF, and performed site assessments for this species in the vicinity of the Project. The study covered the area within the FERC Project Boundary and a 1-mi radius of the boundary, as well as an area within 1- mi of streams in which flows may be affected by the Project.

Known CRLF records in the study area were compiled from a review of the following sources: CNDDDB (CDFG 2012b); University of California, Berkeley's Museum of Vertebrate Zoology Data Access (MVZ 2012); California Academy of Sciences online records (CAS 2012); CRLF Recovery Plan (USFWS 2002b); a Geographic Information Systems shapefile of the final Critical Habitat for the CRLF (75 FR 12816), and pertinent written reports (Barry 2000, 2002). In addition, YCWA requested information from the PNF and TNF, and interviewed the District Biologist, Yuba River Ranger District, TNF (M. Tierney, pers. comm., 2011).

YCWA found records of CRLF occurrences in only one part of the study area (Table 3.3.5-4). The records were for occurrences at two small, spring-fed depressions near Oregon Hill Road and Little Oregon Creek, less than one-mile west of New Bullards Bar Reservoir. Little Oregon

Creek is a tributary to New Bullards Bar Reservoir and not associated with Oregon Creek, which is a tributary to the Middle Yuba River southeast of New Bullards Bar Reservoir. Proximate to Little Oregon Creek, but with no apparent hydrologic connection, the locations are within an area with evidence of substantial historical mining; including piles of mine tailings, excavations, terracing created by hydraulic mining and resulting surface spring flows. The area surrounding the sites is designated by the USFWS as Critical Habitat for CRLF as Unit YUB-1.

Table 3.3.5-4. Recorded occurrences of CRLF within 1 mile of the Yuba River Development Project FERC Project Boundary and other known occurrences in Yuba, Nevada, Sierra or Butte counties.

Occurrence	Distance from the Project and Other Details of Habitat and Observations of CRLF
Near Little Oregon Creek at Oregon Hill Road, Yuba Co. and associated Critical Habitat Unit YUB-1.	Approximately 0.5 mile west of New Bullards Bar Reservoir. Two small, spring-fed, mine-tailing wetlands in the area that burned in 1999. ¹
	Total of six adults from the two wetlands, 2000. Population presumed to be extant by CNDDDB (CDFG 2012b).
	Total of six adults and two tadpoles from the two wetlands, 2001 (Barry 2002).
	Total of eight adults from the two wetlands, 2004. From transcribed notes received from M. Tierney (2009).
Near Little Oregon Creek at Oregon Hill Road, Yuba Co. and associated Critical Habitat Unit YUB-1. (cont.)	One adult, 2005. From transcribed notes received from M. Tierney (2009).

¹ This occurrence consists of two small, spring-fed wetlands, which are referred to as assessment site LO21 and LO28 in the YCWA Relicensing study. The wetlands are approximately 230 ft apart and are treated as one location in the detailed information in this table.

To qualify as potentially suitable CRLF breeding habitat, the aquatic habitat sites needed to meet USFWS criterion for essential aquatic habitat - low-gradient fresh water bodies capable of holding water for a minimum of 20 weeks in all but the driest of years (i.e., the period required for CRLF to go from egg stage to metamorphosis). Site assessments included characterizing potential aquatic breeding habitats and adjacent upland habitat, including dispersal habitat. Habitat locations that were accessible on-site or viewable from an adjacent public road were assessed in the field. Locations not accessible or viewable in the field were evaluated from aerial imagery.

YCWA identified 274 aquatic habitat locations for site assessments. A majority of the sites (n=164) were within a mile of the FERC Project Boundary and 110 were within a mile of stream reaches in which flows may be affected by the Project, but are more than a mile from the existing Project Boundary.

Of the 164 sites within a mile of the FERC Project Boundary, 91 were classified as meeting the minimum criterion of 20-week persistence of standing or slow-moving water; six sites did not meet the criterion because of insufficient persistence, and the available information was inconclusive for the other 67 sites. Most of the sites meeting the criterion were streams (n=58) or stream impoundments (n=9). Seasonal streams in areas that could not be field assessed constituted most of the sites (n=62) for which no determination was made. Perennial streams that were not field-assessed were assumed to meet the criterion, including high-gradient streams where standing or slow-moving water would likely be limited to plunge pools. Other types of aquatic habitats that were determined to meet the 20-week criterion included excavated ponds (n=24 sites) and depressional wetlands associated with old mining excavations or mine tailings

(n=7 sites). Two of these mining legacy sites have recorded occurrences of CRLF, as described above. The CRLF population at the sites is presumed to be extant. No CRLF were observed here, or at other locations during the performance of this study or incidentally during the performance of other Relicensing studies to date.

Of the 110 sites within a mile of Project-affected stream reaches, 91 met the minimum 20-week criterion for persistence of standing or slow-moving water, two did not meet the criterion, and there was insufficient information to make a determination for 17 sites. Most of the sites that met the criterion were excavated ponds (n=56), mining legacy water bodies (n=12), or impoundments of small tributaries to the Yuba River (n=12). Mining legacy included the Yuba Goldfields, which were represented by a single assessment site comprised of a complex of more than 36 separate National Wetland Inventory-mapped wetlands, mostly classified as palustrine open water features. Only four of the sites within a mile of Project-affected stream reaches were free-flowing streams, all of which met the criterion. None of the Project-affected streams represent potential CRLF breeding habitat.

The three Project impoundments were included in this assessment. New Bullards Bar Reservoir and Our House Diversion Dam impoundment on the Middle Yuba River do not represent potential breeding habitats for CRLF, and Log Cabin Diversion Dam impoundment on Oregon Creek is also unlikely to be used. New Bullards Bar Reservoir is a deep reservoir with mostly steeply-sloped banks and supports a recreational fishery. The two diversion impoundments are situated on streams with seasonal high flows driven by snow-melt runoff occurring in most years, conditions incompatible with CRLF breeding.

There are no other known current or historical occurrences of CRLF in or near the study area. Documented occurrences in Nevada County (Sailor Flat, Critical Habitat Unit NEV-1) and Butte County (Hughes Place Pond, Critical Habitat Unit BUT-1) are 6.2 and 21.7 mi, respectively, from the nearest site and designated Critical Habitat.

Critical Habitat Unit YUB-1 has been designated for 2,558 hectares (6,322 ac) surrounding the documented occurrence near Little Oregon Creek. Special management considerations or protection for this unit may be required, associated with wildland fire suppression, timber harvest activities, and controlling predation by non-native species (75 FR 12816). Forest Service biologists on the Plumas National Forest have been intermittently monitoring the two locations with historical observations of CRLF since the species was initially found, with additional monitoring of other locations within Critical Habitat Unit YUB-1 for the past two years, during which time there have been no CRLF sightings (M. Cisneros, pers. comm. 2013).

3.3.5.4 Effects of the Proposed Action on ESA-Listed Species Under USFWS' Jurisdiction

This section includes a description of the anticipated effects of YCWA's proposed Project, which includes YCWA's proposed PM&E measures (Appendix E2) on ESA-listed species under USFWS' jurisdiction. The section is divided into the following areas: 1) effects of construction-related activities; 2) effects of Project O&M.

YCWA's proposed Project includes the following conditions related to ESA-listed terrestrial species:

- Proposed Condition GEN1: Organize Ecological Group and Host Meetings
- Proposed Condition GEN2: Annual Review of Special-Status Species Lists and Assessment of New Species on NFS Lands
- Proposed Condition GEN3: Provide Environmental Awareness Training to Employees
- Proposed Condition GEN5: Special-Status Species on NFS Lands
- Proposed Condition GEN6: Review of Improvements on NFS Lands
- Proposed Condition GS3: Implement Our House and Log Cabin Diversion Dams and New Bullards Bar Reservoir Woody Material Management Plan
- Proposed Condition WR4: Determine Water Year Types for Conditions Pertaining to Narrows 2 Powerhouse and Narrows 2 Full Bypass
- Proposed Condition WR7: Implement Water Temperature Monitoring Plan
- Proposed Condition WR8: Implement Water Quality Monitoring Plan
- Proposed Condition AR3: Maintain Minimum Streamflows at Narrows 2 Powerhouse and Narrows 2 Full Bypass
- Proposed Condition AR5: Implement Aquatic Invasive Species Management Plan
- Proposed Condition AR8: Implement Lower Yuba River Aquatic Monitoring Plan
- Proposed Condition AR9: Control Project Ramping and Flow Fluctuations Downstream of Englebright Dam
- Proposed Condition TR1: Implement Integrated Vegetation Management Plan
- Proposed Condition RR1: Implement Recreation Facilities Plan
- Proposed Condition LU1: Transportation System Management Plan

Refer to Appendix E2 for the full text of the proposed conditions. Each condition is discussed below, including how the condition would protect or enhance ESA-listed species under USFWS' jurisdiction. Implementation of these conditions would help to assure no effect or not likely to adversely affect on ESA-listed species. All of the above conditions have been agreed to by USFWS, with the exceptions of Conditions GEN2, GEN5, GEN6, AR3, AR9, TR1, and RR1.

Effects of Construction-Related Activities

YCWA's proposed Project includes the construction of several facilities, including New Colgate Powerhouse TDS, the New Bullards Bar Dam auxiliary flood control outlet, modifications to Our House Diversion Dam and Log Cabin diversion dams fish release outlets, modification to the gates at Lohman Ridge Diversion Tunnel, and the construction of various recreation

facilities. This section provides a summary of the effects of the construction of these facilities on ESA-listed species under USFWS' jurisdiction.

New Bullards Bar Dam Auxiliary Flood Control Outlet

ESA-listed Plants

Construction of the Auxiliary Flood Control Outlet would have no effect on ESA-listed plants. No ESA-listed plants have been documented within or adjacent to the work area, nor is there any appropriate habitat in the area of the proposed work.

YCWA's proposed Condition GEN1 would provide YCWA meet with agencies and Indian tribes annually. The measure would: 1) assure that YCWA's planned activities are efficiently coordinated to the extent possible with the Forest Service and other agency activities; 2) make agencies aware of YCWA's planned O&M activities; and 3) make YCWA aware of all pertinent agency orders, rules and policies that might affect the planned activities. YCWA would meet with agencies in the first quarter of each year to discuss YCWA's planned Project O&M activities, such as new construction. An annual meeting early in the year is appropriate, since YCWA normally develops an annual maintenance plan early in each calendar year. YCWA would file documentation of the meeting with FERC, including recommendations by agencies.

Proposed Condition GEN5 would require YCWA to consult with the Forest Service before taking actions to construct new project features on NFS lands, and to prepare and submit to the Forest Service a BE for Forest Service approval. The BE would evaluate the potential impact of the action on the species or its habitat, and the Forest Service may require measures for the protection of the affected species on NFS lands.

YCWA's proposed Condition GEN6 would require YCWA to obtain Forest Service approval prior to any new ground disturbance activities on NFS lands.

In addition, YCWA would obtain all necessary permits and approvals for the work, and adhere to the protection and mitigation terms and conditions in these permits and approvals. YCWA anticipates that these permits and approvals will require pre-construction surveys for ESA-listed species in the potentially affected area, and the development of protection measures should any be found.

VELB

Construction of the Auxiliary Flood Control Outlet would have no effect on VELB. Elderberry plants, the host species for VELB, were not found in the potentially affected area during YCWA's relicensing studies. Proposed Conditions GEN1, GEN5 and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for elderberry plants and VELB, would further protect the species.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Construction of the Auxiliary Flood Control Outlet would have no effect on vernal pool fairy shrimp and vernal pool tadpole shrimp. YCWA's studies did not find these species or habitat for them during relicensing, nor are they reported to occur in the area. Proposed Conditions GEN1, GEN5 and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for vernal pools, would further protect the species.

CRLF

Construction of the Auxiliary Flood Control Outlet would have no effect on CRLF. The frog is not known to be present and is unlikely to occur in the affected area, where suitable aquatic habitat for CRLF does not occur. Terrestrial habitat in the affected area is associated with the abutment of New Bullards Bar Dam, as well as areas being considered for laydown/staging and construction disposal, including locations near existing roads and a quarry. Proposed Conditions GEN1, GEN5 and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for CRLF, would further protect the species.

New Colgate Powerhouse Tailwater Depression System

ESA-Listed Plants

Construction of the New Colgate Powerhouse TDS would have no effect on ESA-listed plants. No ESA-listed, NNIP, riparian habitat, wetlands, or other sensitive areas are known to exist in the fenced New Colgate Powerhouse yard, and all work will be confined to the powerhouse, yard and immediate vicinity. Proposed Condition GEN1, which is discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for ESA-listed plants, would further protect the species.

VELB

Construction of the New Colgate Powerhouse TDS would have no effect on VELB. Elderberry plants, the host species for VELB, were not found in the potentially affected area during YCWA's relicensing studies. Proposed Condition GEN1, which is discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for elderberry plants and VELB, would further protect the species.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Construction of the New Colgate Powerhouse TDS would have no effect on vernal pool fairy shrimp and vernal pool tadpole shrimp. YCWA's studies did not find these species or habitat for them during relicensing, nor are they reported to occur in the area. Proposed Condition GEN1, which is discussed above, and adherence to the terms and conditions in all necessary permits and

approvals for the work, as well as pre-construction surveys for vernal pools, would further protect the species.

CRLF

Construction of the New Colgate Powerhouse TDS would have no effect on CRLF. The frog is not known to be present and is unlikely to occur in the affected area, which does not include any aquatic habitat suitable for CRLF. Work will be confined to the powerhouse, yard and immediate vicinity, areas already disturbed. Proposed Condition GEN1, which is discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for CRLF, would further protect the species.

Modifications to the Fish Release Outlets at Our House Diversion Dam and Log Cabin Diversion Dam

ESA-Listed Plants

Modification to the Our House and Log Cabin diversion dams fish release outlets would have no effect on ESA-listed plants. The work would occur in a very small area, where no ESA-listed plants have been documented and with no potential habitat for the plants. Proposed Conditions GEN1, GEN5 and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for ESA-listed plants, would further protect the species.

VELB

Modification to the Our House and Log Cabin diversion dams fish release outlets would have no effect on VELB. Elderberry plants, the host species for VELB, were not found in the potentially affected areas during YCWA's relicensing studies. Proposed Condition GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for elderberry plants and VELB, would further protect the species.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Modification to the Our House and Log Cabin diversion dams fish release outlets would have no effect on vernal pool fairy shrimp and vernal pool tadpole shrimp. YCWA's studies did not find these species or habitat for them during relicensing, nor are they reported to occur in the area. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for vernal pools, would further protect the species.

CRLF

Modification to the Our House and Log Cabin diversion dams fish release outlets would have no effect on CRLF. CRLF is not known to be present and is unlikely to occur in the affected areas, where suitable aquatic habitat for CRLF does not occur. Proposed Conditions GEN1, GEN5,

and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for CRLF, would further protect the species.

Modification to Lohman Ridge Diversion Tunnel Intake

ESA-Listed Plants

Modification to the Lohman Ridge Diversion Tunnel Intake would have no effect on ESA-listed plants. The work would occur in a very small area, where no ESA-listed plants have been documented and with no potential habitat for the plants. Proposed conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for ESA-listed plants, would further protect the species.

VELB

Modification to the Lohman Ridge Diversion Tunnel Intake would have no effect on VELB. Elderberry plants, the host species for VELB, were not found in the potentially affected areas during YCWA's relicensing studies. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for elderberry plants and VELB, would further protect the species.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Modification to the Lohman Ridge Diversion Tunnel Intake would have no effect on vernal pool fairy shrimp and vernal pool tadpole shrimp. YCWA's studies did not find these species or habitat for them during relicensing, nor are they reported to occur in the area. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for vernal pools, would further protect the species.

CRLF

Modification to the Lohman Ridge Diversion Tunnel Intake would have no effect on CRLF. CRLF is not known to be present and is unlikely to occur in the affected areas, where suitable aquatic habitat for CRLF does not occur. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for CRLF, would further protect the species.

Recreation Facilities Rehabilitation and Enhancements¹⁸

ESA-Listed Plants

Rehabilitation and enhancements of Project recreation facilities would have no effect on ESA-listed plants. The work would occur in a very small area, where no ESA-listed plants have been documented and with no potential habitat for the plants. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for ESA-listed plants, would further protect the species.

VELB

Rehabilitation and enhancements of Project recreation facilities would have no effect on VELB. Elderberry plants, the host species for VELB, were not found in the potentially affected areas during YCWA's relicensing studies. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for elderberry plants and VELB, would further protect the species.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Rehabilitation and enhancements of Project recreation facilities would have no effect on vernal pool fairy shrimp and vernal pool tadpole shrimp. YCWA's studies did not find these species or habitat for them during relicensing, nor are they reported to occur in the area. Proposed Conditions GEN1, GEN5, and GEN6, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for vernal pools, would further protect the species.

CRLF

Rehabilitation and enhancements of Project recreation facilities would have no effect on CRLF. CRLF is not known to be present and is unlikely to occur in the affected areas, where suitable aquatic habitat for CRLF does not occur.

YCWA's proposed Condition RR1 includes two measures for the protection of CRLF. The first is the installation of drainage plates with circular opening no larger than 0.25 inch on the drain pipes or basins associated with outdoor faucets. The second is that pesticides would only be

¹⁸ YCWA has completed all FERC-approved studies, and filed the results with FERC. However, YCWA's proposed Condition RR1, *Recreation Facilities Plan*, includes the construction and operation of a new Kelly Ridge Campground and a new recreation vehicle (RV) dump station. Since the facilities were agreed to very late in the relicensing and, as conceived at this time, would be located on approximately 57 ac of NFS lands outside the existing Project boundary, YCWA's relicensing studies did not include the area where the new Kelly Ridge Campground and the new RV dump station would be located, which are shown in the *Recreation Facilities Plan*. Therefore, YCWA will perform botanical studies (i.e., water and aquatic studies are not proposed because the area does not include and is not adjacent to any surface water), including for ESA-listed plants in these areas in 2017 and will file with FERC the results of the studies when they are available.

applied in the campground with Forest Service approval and in compliance with all federal, state and local regulations.

Proposed Conditions GEN1, GEN5, GEN6 and RR1, which are discussed above, and adherence to the terms and conditions in all necessary permits and approvals for the work, as well as pre-construction surveys for CRLF, would further protect the species.

Effects of Proposed Project Operations and Maintenance

ESA-Listed Plants

Continued Project O&M would have no effect on ESA-listed plants. Project O&M activities that have a potential to affect ESA-listed plants include ground- disturbing activities, recreation, and vegetation control, including the application of pesticides. As described above, YCWA studies did not find ESA-listed plants in the proposed FERC Project Boundary. In addition, YCWA's field teams performing other relicensing studies from 2009 through 2013 did not record any incidental observations of ESA-listed plant species.

Of the four potentially occurring ESA-listed plants on the Project, none are likely to colonize within the proposed Project Boundary. Pine Hill flannelbush has been identified exclusively on the Pine Hill formation and is therefore, unlikely to colonize the Project. Layne's ragwort and Stebbins' morning-glory both grow primarily on gabbro or serpentine soils; neither was found on the Project, so they are also unlikely to colonize the Project. Finally, Hartweg's golden sunburst grows on Mima mounds, which are also not present within the proposed Project Boundary.

YCWA's proposed Condition GEN2 would provide that YCWA would annually review species lists to determine if new special-status species, including ESA-listed species, are included in the lists. If so, YCWA would consult with agencies to determine if the species has the reasonable potential to be affected by the Project and, if so, perform surveys. The result of the surveys would be provided to agencies and FERC.

YCWA's proposed Condition GEN3 would provide YCWA annually train its O&M staff regarding the location of sensitive areas (e.g., locations where ESA-species are known to occur, and sensitive habitat, such as vernal pools), and identification of key species, such as ESA-listed plants so that the species can be avoided if observed, and procedures to report observed occurrences of key species.

Besides providing general guidance regarding vegetation and NNIP management, Proposed Condition TR1 would provide that YCWA periodically perform surveys for sensitive plants, such as ESA-listed species and elderberry (the host plant to VELB), and consult with the Forest Service prior to removing any hazard trees.

In addition, YCWA's proposed Conditions GEN1, GEN5, and TR1, which are discussed above, would provide added protection to ESA-listed plants.

VELB

Project O&M activities that have a potential to affect VELB include ground-disturbing activities, recreation, and vegetation control, including the application of pesticides.

Field surveys conducted by YCWA located one elderberry plant on land managed by the Sierra Foothill Research and Extension Center, University of California. The elderberry bush that was found is in a non-riparian community, dominated by annual grasses and blue oak. It is approximately 20 ft from the northeast edge of the Narrows 2 Powerhouse access road and separated from the road by a fence. Surveyors reported eight stems, two having a diameter of 3.5 in at the ground and six at less than 3 in. VELB indicators (i.e., boreholes) were not observed.

No recreation, Project O&M or other Project-related activities occur in the area, which is fenced.

In addition, YCWA's proposed Conditions GEN1, GEN2, GEN3, and TR1, which are discussed above, would provide added protection to VELB.

The proposed Project would, therefore, have no effect on VELB.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Project O&M activities that have a potential to affect vernal pool fairy shrimp and vernal pool tadpole shrimp include ground-disturbing activities, recreation and vegetation control, including the application of pesticides, in areas where these species could occur. However, no suitable habitat for vernal pool fairy shrimp or vernal pool tadpole shrimp exists within the proposed Project Boundary, the area within which these Project O&M activities are confined.

Vernal pool fairy shrimp and vernal pool tadpole shrimp do not occur in streams and therefore, have no potential to occur in stream reaches that may be affected by Project flows. These species could potentially occur in habitats proximate to stream reaches that may be affected by Project flows, but where hydrology is governed by direct precipitation with seasonal drying.

In addition, YCWA's proposed Conditions GEN1, GEN2 and GEN3, which are discussed above, would provide added protection to VELB.

The proposed Project would, therefore, have no effect on vernal pool fairy shrimp and vernal pool tadpole shrimp.

CRLF

Project O&M activities that have a potential to affect CRLF and its Critical Habitat include ground-disturbing activities, recreation and vegetation control, including the application of pesticides, in aquatic or terrestrial habitats where this species may occur. There is a low potential for Project flows to affect CRLF use of stream reaches, which could represent non-breeding or dispersal habitat. Seasonally low water surface elevation at the mouths of certain tributaries on New Bullards Bar Reservoir could indirectly affect CRLF if these conditions are beneficial to American bullfrog.

No CRLF were observed during the performance of this study or incidentally during the performance of other relicensing studies. Habitats at New Bullards Bar Reservoir are unlikely to

attract or support CRLF. Accordingly, operations of New Bullards Bar Reservoir, a storage reservoir, are unlikely to directly affect CRLF.

The two diversion impoundments are situated on streams with seasonal high flows driven by snow-melt runoff occurring in most years, conditions that are incompatible with CRLF breeding.

YCWA is unaware of any study or report that shows that CRLF breeds in large, perennial streams comparable to those that may be affected by Project flows, and specifically in Sierra Nevada streams of this kind where the hydrology is governed by snow-melt runoff. The TNF LRMP (Forest Service 1990), as amended, defines potential CRLF breeding habitat as “*aquatic habitats that contain water through July 31 (such as lakes, ponds, and water holes, and low gradient [$<4\%$] stream habitats lacking spring flushing flows) located below 5,000 ft.*” Barry and Fellers (2013) indicate that historical CRLF habitat in the Sierra Nevada was associated with small, narrow, permanent or nearly permanent creeks near the headwaters, and report no evidence of historical or current breeding populations on large streams in the Sierra Nevada. Under both unimpaired hydrology and current conditions, high spring flows often occur in streams downstream of the Project that are incompatible with CRLF breeding habitat. In addition, these streams do not exhibit the vegetation and substrate conditions characteristic of CRLF habitat. Introduced predatory fish, including smallmouth bass, are also well established.

New Bullards Bar Reservoir is less than 1-mi from an area near Oregon Hill Road and Little Oregon Creek with known recorded occurrences of CRLF, a population which is presumed extant, although there have been no confirmed sightings reported since 2005. The Critical Habitat Unit YUB-1 has been designated for 2,558 hectares (6,322 ac) surrounding these occurrences (CDFG 2012b; 75 FR 12816). The sites with documented occurrences of CRLF and other similar, mining legacy sites in the same general vicinity that appear to be suitable habitat are 0.12 to 0.45 mi from New Bullards Bar Reservoir and are not connected to Little Oregon Creek, a fish-bearing tributary of the reservoir. Project O&M activities do not occur at any of these mining legacy sites and no recreational activity associated the Project occurs at these sites. Some of the sites are located near Oregon Hill Road, on which road traffic appears to be low. Moran Road has a seasonal closure designed to minimize potential for road traffic to affect CRLF making overland movements (YCWA 1993).

There have been no recorded observations of CRLF in Little Oregon Creek itself, or other tributaries. Site assessment results and earlier observations by Barry (2002) suggest that tributaries of New Bullards Bar Reservoir are, at best, marginal habitat for CRLF, but could represent seasonal, non-breeding aquatic habitat.

Mining legacy wetlands in the Little Oregon Creek area are unlikely to support American bullfrog breeding, because these are relatively small sites (i.e., 0.003-0.20 ac) and some do not hold water for a sufficient period. However, a juvenile American bullfrog was observed at one of the wetlands on July 11, 2013 and juveniles were sighted earlier in 2013 by Forest Service at another wetland and in Little Oregon Creek (M. Cisneros, pers. comm. 2013). Juvenile American bullfrogs, which may have originated at Moran Cove on New Bullards Bar Reservoir or may have originated elsewhere, could prey on smaller juvenile CRLF. USFWS identified controlling predation by non-native species, such as American bullfrog, as a special management

consideration for Critical Habitat Unit YUB-1, in addition to wildland fire suppression and management of timber harvest activities (75 FR 12816). As such, the Forest Service is considering efforts to remove juvenile American bullfrogs from regularly monitored mining legacy sites within the Critical Habitat Unit (M. Cisneros, pers. comm. 2013).

The Forest Service has also developed a plan to restore and improve habitats for CRLF within Critical Habitat Unit YUB-1. The Pendola CRLF Critical Habitat Restoration Project will include measures to connect or deepen existing depressions to create small ponds, restore connections to Little Oregon Creek, and create two new ponds as potential CRLF breeding habitat in the Little Oregon Creek area (Forest Service 2016).

A USFWS BO dated February 4, 2004 (USFWS 2004d) addressed the effects of a variety of management activities at New Bullards Bar Reservoir on CRLF and other listed species. The proposed actions consisted of removal and disposal of hazardous, floating woody debris at New Bullards Bar Reservoir; hazard tree removal; vegetation management of campgrounds, day-use areas, and Forest Service facilities around the reservoir; and other associated management activities described in the *Draft New Bullards Bar Fish and Wildlife Management Plan* (Forest Service 2002b).

Prior to the USFWS BO and in consultation with Forest Service, YCWA relocated the hazardous woody debris disposal area away from Moran Cove to the west bank of Garden Point, because of potential conflicts with bald eagle and CRLF. The Forest Service and YCWA identified three sites, all on Garden Point peninsula, for the collection and burning on floating material. The Primary and Secondary burning sites were designated as the preferred locations and first to be used each year, whereas the Tertiary Burn Site was only to be used for additional storage and burning if needed. In the event that there is excess floating woody debris that cannot be accommodated at the three sites, additional storage or disposal sites may be needed and YCWA and the Forest Service agreed emergency consultation with USFWS may be required.

YCWA's proposed Project includes YCWA proposed Condition GS4. The New Bullards Bar Reservoir Floating Material Management Plan provides that floating material will be stored and burned in the Primary and Secondary burn sites. However, because YCWA has found that the Tertiary Burn Site is too steep to be safely used, the plan provides that in emergencies, material may be stored for short periods and burned in part of Moran Cove. YCWA will endeavor to dispose of the material at the Moran Cove site within the same year (i.e., no later than November 14 of that year). If the woody debris cannot be disposed of in that time period, a qualified biologist will survey the site for YCWA to assess whether the condition of the site has enhanced conditions for American bullfrog, which may necessitate bullfrog control efforts. This is consistent with the *Draft New Bullards Bar Fish and Wildlife Management Plan* (Forest Service 2002b), which states that if specific areas within the management area are identified as having large numbers of American bullfrogs or other non-native predatory species, a predator control plan should be developed and efforts made to remove these species.

The terms and conditions of USFWS' BO included a requirement that prior to removal of any hazard tree in the Moran Cove area, a biologist will check the area for CRLF. In the event that personnel engaged in hazard tree removal or the other proposed actions observes frogs larger

than 2 inches (i.e., any species other than Sierran treefrog, the most commonly observed species, which does not exceed 2 inches body length), a Forest Service biologist will review the site before activities continue.

YCWA's proposed Condition TR1 includes implementing an Integrated Vegetation Management Plan. The plan specifies among other things that prior to removing any hazard trees in the Moran Cove area, YCWA will consult with the Forest Service to survey the proposed work area for CRLF.

YCWA's proposed Condition AR5 includes a measure for American bullfrog population suppression at Moran Cove, which is potentially beneficial to CRLF. The measure involves capturing and lethal removal of adult, juvenile, and larval American bullfrogs annually during the first 5 years after license issuance (i.e., License Years 1 through 5) during late summer/early fall at Moran Cove within the FERC Project Boundary. In the fifth bullfrog population suppression report (i.e., for License Year 5), YCWA will report on its consultation with the Forest Service, USFWS, Cal Fish and Wildlife, and SWRCB regarding whether to continue the suppression efforts and, if so, any modifications to the suppression methods.

With the terms and conditions, the BO concluded that the proposed actions (i.e., removal and disposal of hazardous, floating woody debris at New Bullards Bar Reservoir; hazard tree removal; vegetation management of campgrounds, day-use areas, and Forest Service facilities around the reservoir; and other associated management activities) were unlikely to have an adverse effect on CRLF.

In addition, YCWA's proposed Conditions GEN1 and GEN3, which are discussed above, would provide added protection to CRLF.

With implementation of the conditions proposed by YCWA, the proposed Project is not likely to adversely affect CRLF or its Critical Habitat.

3.3.5.5 ESA-Listed Fish Species Under NMFS' Jurisdiction

3.3.5.5.1 Status of ESA-listed Fish Species

The status, critical habitat, life history, distribution, threats, and stressors of the California Central Valley steelhead DPS, the Central Valley spring-run Chinook salmon ESU, and the North American green sturgeon southern DPS are discussed in detail in the APDBA, which is included in Volume IV of this Amended FLA.

3.3.5.5.2 Effects of the Proposed Action

NMFS uses a sequential analysis to assess the effects of proposed federal actions on endangered and threatened species and their designated critical habitats (NMFS 2009b; NMFS 2016b). According to the document titled *An Assessment Framework for Conducting Jeopardy Analyses Under Section 7 of the Endangered Species Act* (NMFS 2004a), one of the early steps in NMFS' evaluation process is to "deconstruct" the Proposed Action into its constituent parts. The

constituent components associated with the Proposed Action include existing Project facilities, existing environmental measures in YCWA's current FERC license and existing measures in other licenses, agreements and contracts that affect Project operations, as well as proposed changes to Project facilities, proposed new Project facilities and YCWA's proposed conditions for its new FERC license.

It is recognized that assessing the incremental effect of individual constituent components, and assessing the ability of the ESA-listed fish species to tolerate the incremental effects of the constituent components are problematic. This is due to the interconnectivity of individual constituent components and the inherent variations in biological responses to suites or combinations of the constituent components of the Proposed Action. Hence, systematic consideration is given to whether each of the constituent components of the Proposed Action has the potential to contribute to changes in flow, water temperature, or other habitat conditions in the lower Yuba River (see YCWA's APDBA in Volume IV of this Amended FLA).

The following discussions focus on the constituent components of the Proposed Action that have the potential to affect ESA-listed fish species or their designated critical habitats in the Yuba River downstream of Englebright Dam. The constituent components are discussed by category of potential effect, including: 1) actions that will have no effect to ESA-listed fish species or their critical habitats; 2) actions that may affect but are not likely to adversely affect ESA-listed fish species or their critical habitats; and 3) actions that may adversely affect ESA-listed fish species or their critical habitats.¹⁹

Actions That Will Have No Effect to ESA-Listed Fish Species or Critical Habitats

The Proposed Action includes various constituent components and activities upstream of the Action Area. These activities will be conducted in locations that are not occupied by any of the ESA-listed fish species and are not designated as critical habitats. These activities will occur upstream of the Action Area and many of them do not have the potential to transmit effects downstream to the lower Yuba River. Some of these constituent components are administrative in nature, and do not have the potential to adversely affect listed species or critical habitats. Others refer to implementation of management plans, many of which are terrestrial, or will be so

¹⁹ According to USFWS and NMFS 1998, "Is likely to adversely affect" is the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. An "is likely to adversely affect" determination requires formal section 7 consultation." NMFS (1998), therefore, requires that any proposed action that may affect a listed species or designated critical habitat and that does not fit within the definition of "is not likely to adversely affect" must be classified as "is likely to adversely affect." However, even though some components of the Proposed Action may have some effects that are not completely discountable, insignificant or beneficial, that does not necessarily mean that each such component "is likely" to adversely affect the listed species. To the contrary, and as discussed in detail in YCWA's APDBA, many components of the Proposed Action may have effects that, while not completely entirely discountable, insignificant or beneficial, still are not likely to adversely affect the listed species or their critical habitats. YCWA's APDBA, therefore, uses the alternative term "may adversely affect" for components of the Proposed Action that may affect listed species or their critical habitats where the potential effects are not completely discountable, insignificant or beneficial. If any component of the Proposed Action is within this "may adversely affect" classification, then formal ESA section 7 consultation will be necessary.

far upstream of the Action Area that resultant effects associated with implementation of them will not be transmitted to critical habitats downstream of Englebright Dam and Reservoir. The three proposed conditions in this category that involve actions located within Englebright Reservoir or downstream of Englebright Dam (i.e., Conditions WR4, WR7, and WR8) will involve abiotic monitoring of reservoir levels, flows and water temperatures that is not expected to affect listed species or their critical habitats.

The constituent components of the Proposed Action that will have no effect to ESA-listed fish species or their critical habitats are listed below.

- YCWA Proposed Condition GEN1: Organize Ecological Group and Host Meetings
- YCWA Proposed Condition GEN2: Annual Review of Special-status Species Lists and Assessment of New Species on NFS Lands
- YCWA Proposed Condition GEN3: Provide Environmental Awareness Training to Employees
- YCWA Proposed Condition GEN5: Special-status Species on NFS Lands
- YCWA Proposed Condition GEN6: Review of Improvements on NFS Lands
- YCWA Proposed Condition WR4: Implement Streamflow and Reservoir Level Compliance Monitoring Plan
- YCWA Proposed Condition WR5: Maintain New Bullards Bar Reservoir Minimum Pool
- YCWA Proposed Condition WR6: Operate New Bullards Bar Reservoir for Flood Control
- YCWA Proposed Condition WR7: Implement Water Temperature Monitoring Plan
- YCWA Proposed Condition WR8: Implement Water Quality Monitoring Plan
- YCWA Proposed Condition AR7: Implement Upper Yuba River Aquatic Monitoring Plan
- YCWA Proposed Condition TR1: Implement Integrated Vegetation Management Plan
- YCWA Proposed Condition TR2: Implement Bald Eagle and American Peregrine Falcon Management Plan
- YCWA Proposed Condition TR3: Implement Ringtail Management Plan
- YCWA Proposed Condition TR4: Implement Bat Management Plan
- YCWA Proposed Condition RR2: Provide Recreation Flow Information
- YCWA Proposed Condition LU2: Implement Fire Prevention and Response Plan
- YCWA Proposed Condition CR1: Implement Historic Properties Management Plan
- YCWA Proposed Condition VR1: Implement Visual Resource Management Plan

Discretionary Activities That May Affect but are Not Likely to Adversely Affect Listed Species or Critical Habitats

The Proposed Action will involve discretionary actions that potentially could affect ESA-listed fish species and their critical habitats within the Action Area of the lower Yuba River. Each of these actions is categorized as Project construction, proposed Project facilities operations, or YCWA's Proposed Conditions, discussed below. For the reasons discussed below, each of these actions may affect, but is not likely to adversely affect, any ESA-listed fish species or their designated critical habitats.

Project Construction

The Proposed Action will involve construction-related modification or enhancement of existing Project facilities and features located in the Action Area, including the following:

- New Colgate Powerhouse New Tailwater Depression System
- New Bullards Bar Dam New Auxiliary Flood Control Outlet
- Modifications to Lohman Ridge Diversion Tunnel Intake
- Modifications to Our House Diversion Dam and Log Cabin Diversion Dam Fish Release Outlets
- Project Roads and Trails
- Recreation-related Construction
 - Enhancements to Existing Facilities/Sites Enhancements
 - ✓ Campgrounds and Picnic Areas
 - ✓ Day Use Areas and Trails
 - ✓ Boat Launches
 - Construction of New Recreation Facilities - Construction
 - ✓ Kelly Ridge Campground
 - ✓ Shadow Ridge Campground
 - ✓ Cottage Creek Picnic Site
 - ✓ Dark Day RV Dump Station
 - ✓ Dark Day Entrance Station
 - ✓ New Colgate Powerhouse River Access
 - ✓ West Shoreline Trail

Effects of Construction-Related Activities

The Proposed Action will involve construction-related modification or enhancement of existing Project facilities and features located in the upper watershed at and around New Bullards Bar Dam and Reservoir, or at or near Project facilities on the Middle Yuba River or Oregon Creek.

Although upstream construction-related activities have a remote potential for hazardous materials or other hydrocarbon-based contaminants to be released and enter New Bullards Bar Reservoir (or Englebright Reservoir), it is reasonable to expect that potential spills would be locally constrained, and the volume of contaminants resulting from a spill would be relatively minor in comparison to the total volume of water in the reservoirs. For example, one gallon of contaminant spilled into New Bullards Bar Reservoir with an estimated storage capacity of 966,103 ac-ft gross storage, or at the end of September target carryover storage of 650,000 ac-ft, would result in a concentration of less than about 1 part per 300 billion and about 1 part per 200 billion, respectively.

Long-term sublethal effects of oil pollution refer to interferences with cellular and physiological processes such as feeding and reproduction, and do not lead to immediate death of an organism (EPA 1986). Disruption of such behavior apparently can result from petroleum product concentrations in the range of 10 to 100 µg/L (EPA 1986). In addition to sublethal effects reported at the 10 to 100 µg/L level, it has been shown that petroleum products can harm aquatic life at concentrations as low as 1 µg/L (Jacobson and Boylan 1973 in EPA 1986). For comparison purposes, 1 part per billion (ppb) is a microgram (µg), or 1/1,000,000th of a gram, of a contaminant present in one liter of water or one kilogram of soil. Therefore, a petroleum product concentration of less than 1 part per 300 billion is considerably below the EPA (1986) thresholds of: 1) 10 to 100 µg/L (i.e., 10 to 100 ppb) that has been identified as having the potential to cause sublethal (e.g., behavioral) disruptions to aquatic life; and 2) 1 µg/L (1 ppb) shown to potentially harm aquatic life.

Additional dilution would be expected to occur as water travels downstream from New Bullards Bar Reservoir from mixing with North Yuba River flows, Middle Yuba River flows, South Yuba River flows, and the additional dilution in Englebright Reservoir.

Given the above considerations, and the distance downstream to listed species occupancy and critical habitat locations, activities on or around New Bullards Bar Reservoir or the Middle Yuba River and Oregon Creek that have the potential to transmit contaminants downstream are unlikely to affect ESA-listed fish species and critical habitats in the lower Yuba River.

There is one proposed trail addition that is not located in the upper Yuba River watershed. A 0.21-mi-long trail to a flow gage downstream of Narrows 2 Powerhouse has been identified as a proposed addition, which would be located adjacent to the lower Yuba River downstream of Englebright Dam. This addition could have the potential to affect the lower Yuba River by contributing sediment via erosion or if spills occur during construction, although trail construction may be accomplished by hand tools only.

Temporary erosion prevention and control measures will be implemented during construction or reconstruction of Project facilities and infrastructure. This includes, but is not limited to, reconstruction at dam sites, road reconstruction, and recreation site development, where ground disturbance and/or vegetation removal is expected. It also includes the addition of the trail to the gage. These measures will be based on local, state and federal permit requirements and best management practices (BMPs) for NFS land, YCWA BMP's, including the development of a Stormwater Pollution Prevention Plan (SWPPP) and measures included in a 1602 Agreement, if the work requires such an agreement. Non-storm water BMPs will be implemented by YCWA year-round for construction or maintenance activity within the FERC Project Boundary. Measures will be site-specific for each planned construction project. These BMPs are designed to minimize soil disturbance and reduce delivery of sediment to waterbodies.

With the incorporation of BMPs, erosion prevention and control measures, SWPPP and the Spill Prevention and Hazardous Materials Management Plans associated with construction, the potential effects to ESA-listed fish species would be avoided or minimized, and thereby would be insignificant. YCWA will obtain all necessary permits and approvals for the construction of Project-related facilities and features. This would be in addition the BMPs and effects avoidance measures described for construction-related activities.

Proposed Project Facilities Operations

Operation and Maintenance of the New Colgate Powerhouse New Tailwater Depression System

The New Colgate Powerhouse TDS will introduce compressed air into the turbine discharge chamber to lower the tailwater elevation to a level that does not interfere with turbine operation, thereby allowing continued turbine operation during high flows. The TDS will enhance the ability to regulate flood releases from New Bullards Bar Reservoir and increase the production of energy. Addition of the New Colgate Powerhouse TDS would have an effect on New Bullards Bar Reservoir operations during flood operations. It would decrease the amount of flood release made through spill gates and increase the amount of flood release and generation made through the powerhouse. These changes would not affect storage in New Bullards Bar Reservoir at the end of the flood event, and would not affect the total volume of water released from New Bullards Bar Reservoir during a flood event, but has some minor, insignificant potential to affect the temperature of water flowing into Englebright Reservoir and subsequently released into the lower Yuba River.

Ongoing Operation and Maintenance of New Bullards Bar Reservoir Recreation Facilities

As described in YCWA's Recreation Facilities Plan, routine maintenance is considered short-term maintenance activities and defined as repair, prevention, and cyclic maintenance, as compared to long-term maintenance (i.e., replacement and rehabilitation of facilities). Routine maintenance is discussed by "short-term" and "annual" maintenance. Long-term maintenance or major rehabilitation is addressed in YCWA's proposed Condition RR1.

While routine maintenance of recreation facilities have the potential to introduce contaminants into New Bullards Bar Reservoir, these activities are not likely to affect flows or water quality in the lower Yuba River, and thus are not likely to affect ESA-listed fish species or their critical habitats. Ongoing routine maintenance of other New Bullards Bar Reservoir recreation facilities will involve a suite of activities that will be terrestrial-oriented, but will have discountable or insignificant effects due to: 1) the separation in the locations of the recreation-related facilities and areas of occupancy of listed species and critical habitats; 2) the incorporation of construction BMPs, SWPPP, spill prevention and hazardous materials management plans; 3) the distance downstream and the dilution from mixing with water in New Bullards Bar Reservoir, mixing with North Yuba River flows, Middle Yuba River flows, South Yuba River flows, and the additional dilution in Englebright Reservoir.

YCWA's Proposed Conditions

YCWA proposes to implement several plans associated with the Proposed Action. Development and implementation of these plans is not likely to adversely affect ESA-listed fish species or their critical habitat in the lower Yuba River, as described below.

YCWA Proposed Condition GS1: Implement Erosion and Sediment Control Plan

YCWA developed an Erosion and Sediment Management Control Plan to minimize future erosion and sedimentation related to the Project. The objectives of the plan are to describe existing YCWA and Forest Service BMPs to control site specific erosion and sedimentation impacts during routine operations, maintenance, new construction, and reconstruction of Project facilities, including emergency erosion control measures and protocols to control sedimentation during or after severe storm events.

Temporary erosion prevention and control measures will be implemented during construction or reconstruction of Project facilities and infrastructure. YCWA also will be prepared to monitor for unexpected, emergency erosion control events within the FERC Project Boundary that develop in response to significant events (e.g., storms and wildfires). Monitoring of erosion and sediment control plans generally includes both implementation monitoring (i.e., was the BMP implemented correctly) and effectiveness monitoring (e.g., did the site revegetate to required standards).

YCWA Proposed Condition GS3: Implement Our House and Log Cabin Diversion Dams and New Bullards Bar Reservoir Woody Material Management Plan

YCWA has developed an Our House and Log Cabin Diversion Dams and New Bullards Bar Reservoir Woody Material Management Plan to provide guidance for YCWA's passage of woody material at Our House Diversion Dam on the Middle Yuba River and at Log Cabin Diversion Dam on Oregon Creek, and for YCWA's annual collection, storage and disposal of woody material on New Bullards Bar Reservoir on the North Yuba River.

YCWA would allow, provided conditions permit safe and reasonable access and working conditions, mobile instream woody material to pass the Our House and Log Cabin diversion dams into downstream reaches. At New Bullards Bar Reservoir, woody material poses a

potential hazard to the public, particularly boaters, jet skiers and water-skiers. To provide for public safety, YCWA historically removed woody material annually from the reservoir surface. YCWA will collect floating woody material by capturing portions of the material in enclosed floating log booms and dragging the woody material by boat to approved storage areas. Work will be performed in accordance with the safety provisions outlined in the Plan.

YCWA Proposed Condition WR1: Implement Hazardous Materials Management Plan

YCWA stores hazardous materials, hazardous material cleanup materials and equipment, and has Business Plans for three facilities – Cottage Creek Water Treatment Plant, Narrows 2 Powerhouse and New Colgate Powerhouse. YCWA has developed a Hazardous Materials Management Plan that addresses the storage, use and transportation of hazardous materials used within the proposed FERC Project Boundary, with special emphasis on NFS lands. This plan describes the standard practices that YCWA follows when storing, using, transporting, and disposing of hazardous materials used for routine O&M of the Project. The plan also addresses YCWA's approach to the storage, use, transportation, and disposal of hazardous materials related to new construction activities.

For most of the Project facilities, the potential spill of hazardous materials is not likely to adversely affect listed species or their critical habitats because of: 1) the separation in the locations of the recreation-related facilities and areas of occupancy of listed species and critical habitats; 2) the incorporation of construction BMPs, and spill prevention and Hazardous Materials Management Plan; 3) the distance downstream and the dilution from mixing with water in New Bullards Bar Reservoir, mixing with North Yuba River flows, Middle Yuba River flows, South Yuba River flows, and the additional dilution in Englebright Reservoir.

For the Narrows 2 Powerhouse, implementation of YCWA's Hazardous Materials Management Plan, and the Business Plan for the Narrows 2 Powerhouse facility, in addition to compliance with water-quality certification under CWA Section 401 from the SWRCB, are expected to avoid direct adverse impacts to listed species and their critical habitat.

YCWA Proposed Condition AR5: Implement Aquatic Invasive Species Management Plan

YCWA has developed an Aquatic Invasive Species Management Plan to provide guidance to manage aquatic invasive species (i.e., quagga and zebra mussels, New Zealand mudsnail, Asian clam, American bullfrog, aquatic plants including Eurasian watermilfoil, hydrilla, water hyacinth, and didymo algae). Goals of the plan are to: 1) implement activities to minimize and prevent the introduction and spread of aquatic invasive species into and throughout Project-affected waters; 2) provide education and outreach to ensure public awareness of aquatic invasive species effects and management throughout Project-affected waters; 3) implement monitoring programs to ensure early detection of aquatic invasive species; 4) ensure all Project aquatic invasive species management activities comply with federal and State of California laws, regulations, policies, and management plans, and with Forest Service directives and orders regarding aquatic invasive species.

YCWA Proposed Condition AR6: Implement New Bullards Bar Reservoir Fish Stocking Plan

YCWA has developed a New Bullards Bar Reservoir Fish Stocking Plan to establish the fish stocking process, procedures, stocking targets and creel (i.e., angler) surveys that YCWA will follow when stocking fish in New Bullards Bar Reservoir.

In addition to the considerations outlined in the New Bullards Bar Reservoir Fish Stocking Plan, it is unlikely that fish planted in New Bullards Bar Reservoir would survive a spill over the 645 ft high New Bullards Dam, or entrainment and passage through the 5.2 mi long penstock to New Colgate Powerhouse, through the powerhouse, down the North Yuba River and the mainstem Yuba River upstream of Englebright Reservoir, through Englebright Reservoir, spill over the 260 ft tall Englebright Dam or through the powerhouses downstream of the dam, and thereby affect listed species or their critical habitats in the lower Yuba River.

YCWA Proposed Condition AR8: Implement Lower Yuba River Aquatic Monitoring Plan

YCWA's Proposed Condition AR8 would develop information regarding aquatic resources in the lower Yuba River downstream of Englebright Dam in response to changes in flow and habitat conditions from the initial license to the new license.

Several of the activities identified in the monitoring plan would involve the handling of fish, and, thus, these activities have the potential to cause stress or injury to listed fish species. Prior to performing fieldwork, YCWA will obtain all necessary permits and approvals required to perform the fieldwork (e.g., scientific collection permits).

It is anticipated that NMFS and Cal Fish and Wildlife will issue permits that will include measures to minimize adverse effects and authorize "take" for the activities specified in the monitoring plan. Separate incidental take authorization would be required for implementation of the monitoring plan.

YCWA Proposed Condition RRI - Implement Recreation Facilities Plan

YCWA has developed a Recreation Facilities Plan to guide management of public recreation use of the Project's recreation facilities over the term of the new license, and minimize recreation use impacts to natural, historic, and cultural resources within the Project area. The plan includes the following objectives to help achieve this goal:

- To provide recreation facilities that meet the needs of Project recreation users and that are consistent with federal, state, and local legal requirements and guidelines
- To monitor recreation use over the term of the license to help ensure Project recreation users achieve high quality recreation experiences and that recreation use impacts are minimized and remain within acceptable limits
- To describe YCWA's responsibilities regarding operation, maintenance and rehabilitation of the Project recreation facilities under the new license

One of the major rehabilitation efforts is replacement of the recreational water supply system. The primary below-ground infrastructure of the water system is more than 40 years old. During the license term, YCWA anticipates that all water systems will need to be upgraded at least once. Upgrading generally includes replacing the existing distribution piping, connections, and water hydrants, while maintaining the same system design and footprint, as warranted.

YCWA's long-term maintenance or major rehabilitation maintenance of New Bullards Bar Reservoir recreation facilities is not likely to adversely affect listed species or their critical habitats, given: 1) the separation in the locations of the recreation-related facilities and areas of occupancy of listed species and critical habitats; 2) the incorporation of construction BMPs, SWPPP, and spill prevention and Hazardous Materials Management Plan; 3) the distance downstream and the dilution from mixing with water in New Bullards Bar Reservoir, mixing with North Yuba River flows, Middle Yuba River flows, South Yuba River flows, and the additional dilution in Englebright Reservoir.

YCWA Proposed Condition LUI: Implement Transportation System Management Plan

YCWA's Transportation System Management Plan provides guidance for the rehabilitation and maintenance of Primary Project Roads and Trails and Project Recreation Roads. The objectives of the plan are to describe the scope of improvements needed for Primary Project and Recreation Roads design, signage, construction and maintenance. YCWA's maintenance program has two components with regards to timing of road maintenance activities: short-term and long-term maintenance.

Short-term road maintenance is defined as routine annual maintenance for localized and seasonal repairs to address normal wear and tear during road use under typical annual weather conditions. Long-term maintenance is defined as repairs that are scheduled around specific events that impact the overall integrity of a given road, such as heavy-haul events or unusually heavy storm events (e.g., January 1997).

Both short-term and long-term maintenance of Primary Project Roads and Project Trails will have discountable or insignificant effects due to: 1) the separation in the locations of the transportation-related facilities and areas of occupancy of listed species and critical habitats; 2) the incorporation of construction BMPs, SWPPP, spill prevention and Hazardous Materials Management Plans; 3) the distance downstream and the dilution from mixing with water in New Bullards Bar Reservoir, mixing with North Yuba River flows, Middle Yuba River flows, South Yuba River flows, and the additional dilution in Englebright Reservoir.

Proposed Action Components that May Adversely Affect Listed Species or Designated Critical Habitats

The Proposed Action will involve some discretionary actions that potentially could adversely affect ESA-listed fish species or their critical habitats within the Action Area of the lower Yuba River. The conclusion that a constituent component of the Proposed Action "may adversely affect" is based on whether that component could contribute either individually, or together with other components, to changes in flows, water temperatures, or other habitat conditions in the

lower Yuba River. Each of these actions is categorized as proposed Project facilities operations, or YCWA's Proposed Conditions, discussed below.

YCWA's Proposed Project Facilities Operations

Operation of the New Bullards Bar Dam Auxiliary Flood Control Outlet

YCWA proposes to construct a new Auxiliary Flood Control Outlet on New Bullards Bar Dam, to be located south of the existing New Bullards Bar Dam spillway in the upper left abutment area of the dam. The primary benefit of the Auxiliary Flood Control Outlet will be increased flood management capability. This increased flexibility in flood management would allow a significant reduction in flood flows and reduced flood stage at Marysville and the Feather River confluence. As configured at this time, the new outlet would have a discharge capacity at the bottom of the New Bullards Bar Reservoir flood pool (elevation 1,918 ft) and at the NMWSE of approximately 45,000 cfs and 66,000 cfs, respectively.

The new Auxiliary Flood Control Outlet would allow for releases from New Bullard Bar Dam when the water surface elevation is below the existing New Bullards Bar Dam spillway in anticipation of large storm events, and would increase New Bullards Bar Dam's existing release capacity during high flow events. The proposed Auxiliary Flood Control Outlet could result in reduced peak flow rates during storms, or shifting the peak release to an earlier time. These operations would affect storage levels in New Bullards Bar Reservoir and flows in the North Yuba River downstream of New Bullards Bar Dam, which would change the timing and volume of inflow into Englebright Reservoir and thereby potentially affect flow and water temperatures regimes in the lower Yuba River.

YCWA's Proposed Conditions

YCWA's Proposed Conditions are described in Section 2 of this Exhibit E, and the descriptions presented here are brief contextual summaries regarding their potential to contribute to changes in flow, water temperature or habitat in the lower Yuba River.

YCWA Proposed Condition GEN4: Develop and Implement a Coordinated Operations Plan to Assure Licensee's Compliance with the New License for the Yuba River Development Project

Once FERC issues a new license to YCWA, the coordinated operations agreement may be different from the existing coordinated operations agreement. Changes to the coordinated operations agreement may result in changes to Narrows 1 and Narrows 2 operations, which could affect flow and water temperatures in the lower Yuba River.

YCWA Proposed Condition GS2: Implement Our House and Log Cabin Diversion Dams Sediment Management Plan

Under YCWA's Proposed Condition GS2, YCWA would operate the low level outlet valves at Our House and Log Cabin diversion dams during high flow events between October 1 and March 21 to move sediment trapped behind the diversion dams to the Middle Yuba River and Oregon Creek, respectively. Flow changes during storm periods could alter the inflow regime to

Englebright Reservoir, and thereby affect flow and water temperatures downstream in the lower Yuba River.

YCWA Proposed Condition WR2: Determine Water Year Types for Conditions Pertaining to Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam

Alteration of minimum instream flow requirements will change the flow profile entering Englebright Reservoir. This proposed condition will affect storage in New Bullards Bar Reservoir, which also affects the NYI index which, in part, determines Yuba Accord flow schedules and minimum flow requirements in the lower Yuba River. Therefore, this condition has the potential to affect flow and water temperatures in the lower Yuba River.

YCWA Proposed Condition WR3: Determine Water Year Types for Conditions Pertaining to Narrows 2 Powerhouse and Narrows 2 Full Bypass

Intra-annual fluctuations in the Yuba Accord flow schedules are expected to be avoided under this proposed condition and will result in more stable flow conditions throughout the course of the year. Thus, this proposed condition has the potential to affect flow and water temperatures in the lower Yuba River during drier years corresponding to a Schedule 5, 6, or Conference Year.

YCWA Proposed Condition WR9: Implement Drought Management Plan

YCWA's Proposed Condition WR9 includes a discussion of measures YCWA might adopt to mitigate the adverse effects of future droughts, and how these measures might affect conditions in the new FERC license. This condition has the potential to affect flow and water temperatures in the lower Yuba River.

YCWA Proposed Condition AR1: Maintain Minimum Streamflows Below Our House Diversion Dam and Log Cabin Diversion Dam

This condition would increase stream flows in the Middle Yuba River downstream of Our House Diversion Dam and in Oregon Creek downstream of Log Cabin Diversion Dam, which would change the timing and volume of inflow into Englebright Reservoir and, thereby, potentially affect flow and water temperatures in the lower Yuba River.

YCWA Proposed Condition AR2: Control Project Spills at Our House Diversion Dam

Proposed Condition AR2 would require YCWA to control the rate of spill cessation for flows over Our House Diversion Dam in non-tunnel-closure years. Reductions in flow will be more gradual and spill periods will be prolonged, which would change the timing and volume of inflow into Englebright Reservoir and thereby potentially affect flow and water temperatures in the lower Yuba River.

*YCWA Proposed Condition AR3: Maintain Minimum Streamflows at Narrows 2
Powerhouse and Narrows 2 Full Bypass*

If implemented, YCWA's Proposed Condition AR3 would increase the required conference year flows, and extend the duration of release. In addition, there will be fewer month-to-month changes in these requirements. These changes in Conference Year minimum flow requirements would result in changes to both flows and water temperatures in the lower Yuba River.

YCWA Proposed Condition AR4: Control Project Spills at New Bullards Bar Dam

Under YCWA's Proposed Condition AR4, YCWA would implement a spill cessation operation, providing for stepped reductions in spills so that down-ramping is gradual while prolonging the total length of time during which each spill event occurs. These changes could result in changes to flows and possibly water temperatures in the lower Yuba River.

*YCWA Proposed Condition AR9: Control Project Ramping and Flow Fluctuations
Downstream of Englebright Dam*

Implementation of YCWA's Proposed Condition would avoid fluctuations in flow in the lower Yuba River downstream of Englebright Dam, further limit the magnitude of flow reductions, and decrease the rate of flow reductions. Although these changes are expected to minimize potential Project effects related to flow ramping and flow fluctuations on salmonids, implementation of this condition has the potential to change the amount, timing and temperature of subsequent releases.

*YCWA Proposed Condition AR10: Maintain Minimum Streamflow Below New Bullards
Bar Dam*

YCWA's proposed Condition AR10 would require new flow requirements for the North Yuba River downstream of New Bullards Bar Dam. If New Colgate Powerhouse is not operating, it can result in more flows, which change inflows into Englebright Reservoir. Also, the additional exposure of water to ambient conditions has the potential to change water temperature inflow to Englebright Reservoir. This condition was included in the Operations Model, and was shown to have the potential to change water temperatures in the lower Yuba River under certain conditions.

YCWA Proposed Condition AR11: Periodically Close Lohman Ridge Diversion Tunnel

Periodic closure of the Lohman Ridge Diversion Tunnel, and concurrent opening of the low level outlet and fish release valve at Log Cabin Diversion Dam has the potential to alter the inflow regime to Englebright Reservoir, and thereby affect flow and water temperatures in the lower Yuba River.

YCWA Proposed Condition AR12: Control Project Spills at Log Cabin Diversion Dam

YCWA's proposed spill cessation schedule for Log Cabin Diversion Dam from April through July in Below Normal, Dry and Critically Dry water years would provide for a stepped reduction in spills so that down-ramping is gradual. The Log Cabin Diversion Dam low level outlet would be used to reduce flows by a maximum of 20 cfs every four days. This proposed condition has the potential to alter the inflow regime to Englebright Reservoir, and thereby affect flow and water temperatures in the lower Yuba River.

YCWA Proposed Condition RR3: Provide Whitewater Boating Below Our House Diversion Dam

Provision of whitewater boating flows between 600 cfs and 2,000 cfs²⁰ on weekends between October 1 and March 31 could result in significant flow changes on the weekends, and would alter inflows to Englebright Reservoir, which could affect flow and possibly water temperatures in the lower Yuba River.

3.3.5.5.3 YCWA's Effects Determinations for ESA-listed Species Under NMFS's Jurisdiction

The incremental effects of the constituent components that may adversely affect ESA-listed species or their critical habitats are consolidated and evaluated collectively as stressors to individuals, populations, and critical habitat of ESA-listed fish species in Section 8.0 of the APDBA. Stressors to ESA-listed fish species emanate from the Environmental Baseline and not the Proposed Action. The magnitudes of these stressors are described and evaluated in Sections 5.0 and 6.0 of the APDBA. Section 8.0 of the APDBA analyzes the changes in the frequencies and magnitudes of stressors to the listed species (individuals, populations, and their designated critical habitats) in the Action Area that are expected to occur under the Proposed Action, relative to the Environmental Baseline. The evaluation addresses whether Environmental Baseline stressors would be exacerbated or alleviated by implementation of the Proposed Action.

According to NMFS (2016c), the analysis of potential effects to individual fish is separate from the analysis of potential effects on designated critical habitats. It states that a BA should first analyze potential impacts to individuals of a species, and then analyze potential impacts to designated critical habitats in the Action Area. The infrequent sightings of green sturgeon in the lower Yuba River and the limited amount of information preclude analyses of abundance, productivity, habitat utilization, life history or behavioral patterns in the lower Yuba River. Accordingly, stressor effects on individuals of the spring-run Chinook salmon and steelhead populations are initially presented in Section 8.0 of the APDBA. Then, the APDBA analyzes the potential effects of the Proposed Action on spring-run Chinook salmon, steelhead, and green sturgeon designated critical habitats.

²⁰ As measured at the USGS Streamflow Gage 11408880.

Summary of Potential Effects to Individuals of the Listed Species

The Proposed Action would not introduce new stressors, or substantially exacerbate ongoing stressors under the Environmental Baseline, to spring-run Chinook salmon or steelhead individuals or populations in the lower Yuba River. Slight changes in the stressors may occur under the Proposed Action relative to the Environmental Baseline. However, as thoroughly evaluated and discussed in Section 8.0 of the APDBA, these slight changes are not of sufficient magnitude or frequency to adversely affect ESA-listed fish species. Implementation of proposed Conditions AR9 and GEN4 would minimize the potential for redd dewatering, and fry and juvenile stranding and isolation.

Incidental Take Considerations

Although stressors to individuals of the spring-run Chinook salmon and steelhead populations are expected to be reduced under the Proposed Action, relative to the Environmental Baseline, there still would be some potential incidental take of individuals associated with Narrows 2 Facilities operations under the Proposed Action.

Redd dewatering and juvenile salmonid stranding and isolation can occur during Project controllable flow conditions, particularly during emergency outage situations and associated coordination of operations between Narrows 1 and Narrows 2 powerhouses. Rapid flow fluctuations can, and have been observed, to result in the potential exposure of redds and in fry and juvenile salmonid stranding and isolation.

It is expected that under the Proposed Action, the potential for redd dewatering, and fry and juvenile stranding and isolation during controllable flow conditions would be reduced with implementation of YCWA's proposed conditions, specifically proposed Condition AR9: *Control Project Ramping and Flow Fluctuations Downstream of Englebright Dam*. Also, the proposed decrease in ramping rate under Condition AR9, from 500 cfs per hour under the Environmental Baseline, to 200 cfs per hour under the Proposed Action, is anticipated to minimize potential effects to juvenile salmonids associated with stranding and isolation in the lower Yuba River.

There also have been observations of adult Chinook salmon apparently confined in an isolated pool in the channel near Narrows 2 Powerhouse. Although measures have been taken to physically restructure the potential isolation areas, and monitoring, reporting and fish rescue procedures have been identified, there is the potential for temporary isolation of adults in pools near the Narrows 2 Facilities in the future.

Although the Proposed Action would result in a decrease in the magnitude of redd dewatering, and fry and juvenile stranding and isolation, and is not anticipated to result in stranding of adult Chinook salmon, there remains the potential for incidental "take" associated with Narrows 2 operations.

Species Determinations

Determinations of effects take into account both the magnitudes and probabilities of occurrence ("exposure") of effects resulting from the Proposed Action to ESA-listed fish species. If

incidental take is anticipated to occur as a result of the Proposed Action, USFWS and NMFS 1998 directs that an “is likely to adversely affect” determination must be made. Following this direction and considering the potential for incidental take of individuals associated with the Proposed Action, this Applicant-Prepared Draft BA concludes that the Proposed Action “may affect, is likely to adversely affect” spring-run Chinook salmon and steelhead in the lower Yuba River.

Summary of Potential Effects to Designated Critical Habitats of the Listed Species

Slight changes in flow-related habitat availability and suitability, and water temperature suitability may occur under the Proposed Action relative to the Environmental Baseline. However, as thoroughly evaluated and discussed in Section 8.0 of the APDBA, the Proposed Action would not result in any substantial changes, either adverse or beneficial, to, or appreciably diminish the value of, any designated critical habitats for Central Valley spring-run Chinook salmon, California Central Valley steelhead, or North American green sturgeon in the Action Area. No substantial increases in the intensity, frequency, or duration of stressors to designated critical habitats in the lower Yuba River under the Environmental Baseline would occur under the Proposed Action.

Determinations of effects take into account both the magnitudes and probabilities of occurrence of effects resulting from the Proposed Action to designated critical habitats. Although slight changes in the flow-related habitat availability and suitability, and in water temperature suitability, may occur under the Proposed Action relative to the Environmental Baseline, the identified slight changes in habitat conditions are expected to be insignificant. The APDBA therefore concludes that the Proposed Action may affect, but is not likely to adversely affect the Central Valley spring-run Chinook salmon, California Central Valley steelhead, and North American green sturgeon designated critical habitats in the Action Area.

3.3.5.6 Proposed Measures Recommended by Agencies or Other Relicensing Participants in Comments on DLA That Were Not Adopted by YCWA

Nine comment letters were filed with FERC regarding YCWA’s DLA. YCWA reviewed each letter and, with regards to ESA-Listed Species, and identified 17 individual proposals to modify a YCWA proposed condition or add a new condition. The recommendations have been organized below by subject to facilitate replies.

Add Conditions to Assess Project Effects on VELB and CRLF

In its March 3, 2014 letter, USFWS recommended a condition “*to address Project effects to ESA-listed species,*” with the following specific reference to CRLF and VELB:

Missing from these proposed license conditions is consideration of Project effects on the California red-legged frog and valley elderberry longhorn beetle. The USFWS recommends that a condition be included to address Project effects to ESA-listed species. Comments addressing effects to the California red-legged frog are addressed above. In addition, the host plant

(*Sambucus* spp.) for the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) occurs within the FERC boundary and the area affected by the Project. Informal consultation with the USFWS regarding protection of the valley elderberry longhorn beetle is needed. A condition to address future Project effects to valley elderberry longhorn beetle should be developed and included in the final license application. (p. 15)

Both a bullfrog management plan and an LWM management plan should be integrated with threatened and endangered species monitoring, because they are plans that are intended to mitigate Project effects while conserving threatened and endangered species. The issue of LWM in New Bullards Bar Reservoir impacting California red-legged frogs and their critical habitat, coupled with the scarcity of LWM downstream of both New Bullards Bar and Englebright dams, indicates that the problems and issues associated with too much wood at one location and not enough wood at other locations can be best addressed through integrated planning. (pp. 15-16)

Subsequent to the USFWS's filing of this comment on the DLA, the USFWS and YCWA reached agreement on an Aquatic Invasive Species Management Plan, an Integrated Vegetation Management Plan, and a Large Woody Material Management Plan, each of which YCWA has included in this Amended FLA (see YCWA proposed Conditions; AR5, *Aquatic Invasive Species Management Plan*; TR1, *Implement Integrated Vegetation Management Plan*; and GS3, *Implement Our House and Log Cabin Diversion Dams and New Bullards Bar Reservoir Woody Material Management Plan*, in Appendix E2). AR5 includes adoption of a focused American bullfrog population suppression at Moran Cove, which is potentially beneficial to CRLF. TR1 contains measures for protection of ESA-listed species which could be beneficial to both CRLF and VELB. Finally, GS3 is a LWM Plan, similar to the one requested. YCWA believes the collaborative agreement on these plans adequately addresses the above DLA comment.

Expand Monitoring for Chinook Salmon and Steelhead Downstream of Englebright Dam

In its March 3, 2014 letter, NMFS recommended:

This proposal does not include adequate monitoring in the area directly downstream of Englebright Dam and the Narrows 2 Development facilities. Please see NMFS comments regarding Chinook salmon stranding filed February 12, 2014 and the monitoring requirements we propose therein (which are far greater in scope and detail than those proposed by the Licensee)...While NMFS agrees that monitoring of adult Chinook salmon and *O. mykiss* immigration/escapement to the Yuba River is important, as well as adult spawning, more juvenile fish monitoring seems warranted. (pp. 13, 14)

Subsequent to NMFS filing of these comments on the DLA, the USFWS, Cal Fish and Wildlife, FWN and YCWA reached agreement on a Lower Yuba River Aquatic Monitoring Plan, which YCWA has included in this Amended FLA (see YCWA proposed Condition AR8, *Implement Lower Yuba River Aquatic Monitoring Plan*, in Appendix E2).

In its March 3, 2014 letter, USFWS suggests additional long-term monitoring of aquatic resources in the Yuba River downstream from Englebright Dam, including the additions of rotary screw trap (RST) monitoring, redd surveys and carcass sampling upstream of Daguerre Point Dam. FWN's March 3, 2014 letter provides similar comments, suggesting that Condition AR8 should include monitoring for a variety of different fish in the lower Yuba River and assess Project effects on juvenile salmonid production over the long-term.

USFWS recommended:

In order to have an industry standard to evaluate the success of the CVPIA AFRP, the USFWS developed protocols for data collection and reporting (Montgomery Watson et al. 1997). Rotary screw traps are an accepted standard for estimating production of juvenile Chinook salmon (USFWS 2008), but they are not currently used in the Yuba River. The USFWS specifically recommends that rotary screw traps be used to study the effects of Yuba Accord flow schedules on salmonids and for long-term monitoring of Project conditions. (p. 7)

and

...carcass sampling continue upstream of Daguerre Point Dam in order to collect biological data and recover coded-wire tags, and (2) redd surveys. (p. 16)

and

Targeted monitoring should be implemented for both steelhead and juvenile salmonids. (p. 16)

and

For juveniles, the USFWS requests that rotary screw trapping and turbidity monitoring be added to this measure. The proposed Yuba River Anadromous Fish Ecological Group (TE3) should be tasked with development of appropriate monitoring programs for steelhead and juvenile salmonids. The USFWS further requests that the monitoring effort be conducted by biologists that are approved by the USFWS, CDFW, and NMFS. Rotary screw traps are not currently used in the Yuba River, even though they are an accepted standard for estimating production of juvenile Chinook salmon. The USFWS requests that established protocols be used in this license, specifically: The 1997 USFWS Comprehensive Assessment and Monitoring Program (CAMP) Implementation Plan; the USFWS 2008 Draft Rotary Screw Trap Protocol for Estimating Production of Juvenile Chinook Salmon; and the

CDFW 2010 Comprehensive Monitoring Plan for Steelhead in the California Central Valley. (p. 17)

FWN recommended:

Licensee's proposed measure should include monitoring for a variety of different fish in the lower Yuba River and should be re-titled "Monitor Fish Populations" to accurately reflect its scope. In addition to Chinook salmon, Licensee should monitor rainbow trout or steelhead populations and green sturgeon. Use of rotary screw traps to monitor juvenile salmonid fitness, production and outmigration is not mentioned in the measure but should be considered. This measure should be clearly linked to the Anadromous Fish Ecological Group as it can function as the advisory group for assessing and informing monitoring projects. (p. 12)

Subsequent to USFWS and FWN filing of these comments on the DLA, the USFWS, Cal Fish and Wildlife, FWN and YCWA reached agreement on a Lower Yuba River Aquatic Monitoring Plan, which YCWA has included in this Amended FLA (see YCWA proposed Condition AR8, *Implement Lower Yuba River Aquatic Monitoring Plan*, in Appendix E2). YCWA believes the collaborative agreement on this condition adequately addresses the above DLA comments.

Clarify Role of Lower Yuba River Anadromous Fish Ecological Group

Several commenters recommended additional detail or clarity as to the role and function of the Lower Yuba River Anadromous Fish Ecological Group.

In its March 3, 2014 letter, NMFS recommended:

...obtaining independent expert review of experimental designs currently used in the M&E Program, and the use of outside experts could be extended to new study designs discussed by the proposed Lower Yuba River Anadromous Fish Ecological Group (proposed Condition TE3). (p 14)

In its February 28, 2014 letter, Forest Service recommended:

This measure should provide more details and definition on the purpose of the group, its structure, and its role in decision making. (p. 28)

In its March 3, 2014 letter, USFWS recommended:

...a process similar to the Narrows 1 Mitigation Fund (FERC P-1403) be implemented. (p. 17)

In its February 28, 2014 letter, SWRCB recommended:

...YCWA clarify the management structure of the Group and how final decisions will be made and executed... (p. 3);

In its March 3, 2014 letter, BLM recommended:

BLM would like to be included in the group. (p. 7)

In its March 3, 2014 letter, FWN recommended:

...that Licensee include NGO and/or public representatives in this group. In addition, we recommend that Licensee work with relicensing participants to further refine its scope of duties and decision-making process. (p. 13)

Commenters also recommended expansion of the purview of the Group as described below.

The Forest Service recommended:

...other special status species and project-affected stream reaches upstream of Englebright. Alternatively a new measure for an upstream group could be developed. (p. 30)

Cal Fish and Wildlife recommended:

...YCWA consider including a measure for a consultation group that would cover the portion of the Project upstream of Englebright Dam Reservoir. (p. 40)

FWN recommended:

Licensee should expand the geographic scope of the group to include the Upper Yuba River and Middle Yuba River operations (or create a similar separate group). (p. 13)

Subsequent to NMFS, the Forest Service, USFWS, SWRCB, BLM, and FWN filing these comments on the DLA, the Forest Service, USFWS, Cal Fish and Wildlife, and FWN reached agreement with YCWA on a condition that would form an ecological group, which YCWA has included in this Amended FLA (see YCWA proposed Condition GEN 1). YCWA believes the collaborative agreement on this condition adequately addresses the above DLA comments, although NMFS, which did not participate in the discussions.