BEFORE THE
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

CERTIFICATE OF SERVICE

I hereby certify that U.S Fish and Wildlife Service's Comments on the February 2016 Pre-Application Document and Proposed Studies and Study Requests for the Camp Far West Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project #P-2997 has this day been electronically filed with the Federal Energy Regulatory Commission and served, via deposit in U.S. mail or by electric mail, upon each other person designated on the Service List for Project P-2997 compiled by the Commission Secretary.

Dated at Sacramento, California, this 8th of September, 2016.

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United States Department of the Interior

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In Reply Refer to:

September 7, 2016

Bradley J. Arnold
General Manager/Secretary
South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659

Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: U. S. Fish and Wildlife Service Comments on the February 2016 Pre-Application Document and Proposed Studies for the Camp Far West Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. P-2997 on the Bear River; Nevada, Yuba, and Placer Counties, California

Dear Mr. Arnold and Ms. Bose:

The U.S. Fish and Wildlife Service (Service or USFWS) has reviewed the February 2016 Pre-Application Document (PAD) and Proposed Studies for the new licensing of the Camp Far West Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC or Commission) Project Number P-2997. Our comments are pursuant to the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531, *et seq.*), the Federal Power Act (FPA), as amended (16 U.S.C. § 791a, *et seq.*); the Fish and Wildlife Coordination Act (FWCA), as amended (16 U.S.C. § 661, *et seq.*); the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703-712); the Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended (16 U.S.C. § 668-668d); the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. §4321 *et seq.*); and the Central Valley Project Improvement Act (CVPIA) (Pub. L. No. 102-575, 106 Stat. 4600, 4706, Title 34 (1992)).

Project Overview

The Project is operated and owned by South Sutter Water District (SSWD, Applicant) and is located on the Western slope of the Sierra Nevada in the Bear River drainage in Nevada, Yuba, and Placer Counties, California. The primary Project facilities include (1) Camp Far West Dam and spillway, (2) Camp Far West Reservoir (impoundment), and (3) the 6.8 MW capacity Camp Far West powerhouse. The SSWD main canal is not included in this FERC relicensing effort (located 1.3 miles downstream of the Project dam). The Project provides developed and

undeveloped recreation opportunities at Camp Far West Reservoir, within the FERC Boundary for the Project. Water-related recreational opportunities include water skiing, wakeboarding, power boating, jet skiing, wildlife viewing, non-motorized boating and warmwater fishing. Camp Far West Reservoir offers anglers shoreline and boat-based fishing opportunities for smallmouth bass, largemouth bass, striped bass, catfish and assorted sunfishes. Land-based recreation opportunities provided within the FERC Boundary and the Project vicinity include camping, wildlife viewing, hiking, biking and horseback riding. The dispersed use areas provide a network of unpaved roads that provide a trail experience for visitors.

There are two developed recreation areas at Camp Far West Reservoir that are owned and maintained by SSWD: The North Shore Recreation Area (NSRA) and the South Shore Recreation Area (SSRA). The NSRA has a general store, Recreational Vehicle (RV) dump station, private ranger residences and maintenance buildings, a water treatment plant, a sewage lagoon, private concessionaire residences and maintenance buildings, a family campground, a group campground, a day use area with swimming beach, a boat ramp, and dispersed use areas. The SSRA is located on the southwest shoreline of the reservoir on a long, narrow peninsula. The SSRA consists of a general store, a family campground, a group campsite, a day use area, a swim beach, a boat ramp, an RV dump station, private ranger residences and maintenance buildings, a sewage lagoon, and dispersed use areas.

Upstream of the Project are three existing FERC hydroelectric projects. In combination with the Project, these contribute to direct, indirect, and cumulative effects to the environment with the Project in the Bear River. These projects include portions of Drum-Spaulding project (P-2310), Yuba-Bear project (P-2266), and Lake Combie/Combie North Aqueduct projects (P-2981 and 7731). There is non-Project grazing both within and outside the FERC Boundary. No federal or state land occurs within or adjacent to the FERC Project boundary or on the Bear River downstream of the Project.

On May 13, 2016, the Commission issued an order granting the use of the Traditional Licensing Process (TLP) for the Project as well as a Notice of Intent to File License Application and Filing of Pre-Application Document.

Service Goals and Objectives

Several resource goals and objectives form the basis of the Service's participation in the licensing process for this Project. The Service is directed to employ an ecosystem approach to ensure conservation of fish and wildlife resources throughout all of its programs. This includes participation in the Commission's licensing processes. The ecosystem approach requires the Service to adopt a comprehensive view within regions and watersheds. Accordingly, the Service encourages the development of comprehensive watershed management plans that foster ecosystem health; through identification of dominant geomorphological features and processes, land use practices, and other activities that may be affecting the drainage. This approach provides for a more thorough analysis of effects to fish and wildlife resources caused by activities such as hydroelectric development, agriculture, grazing, and other human disturbances and identifies a broader range of opportunities for ecosystem improvements.

One Service goal is to conserve and restore the essential attributes of the watershed ecosystem affected by the Project. These attributes include: (1) seasonal discharges that are patterned after the timing, frequency, magnitude, duration, and rate-of-change of the natural unimpaired hydrograph; (2) channel features, floodplains, and riparian vegetation that are shaped, adjusted, and maintained by sufficient instream flows and overbank events; (3) conservation of species listed under the ESA; (4) the conservation and enhancement of natural patterns of the supply, transport and storage of sediments and large woody debris so that imports at the upstream end of a reach are balanced by exports at the downstream end; (5) compliance with water quality standards and criteria; (6) the conservation and enhancement of native aquatic, semi-aquatic, and riparian biota, as well as species dependent upon these biota; (7) the conservation and enhancement of available habitats for these native biota by sufficient instream flows and the necessary components of a natural unimpaired hydrograph, and (8) conservation and protection of anadromous salmonid migration habitat in reaches and tributaries downstream of the Project. Achieving the goal of conserving and restoring anadromous species and listed species habitat and watershed ecosystem attributes underlies the basis for the Service's study requests and eventually will determine the Service's recommendations pursuant to section 10(j) of the Federal Power Act.

To achieve the Service's watershed ecosystem goals, an objective of the Service is the design of an instream flow regime that will protect and enhance stream connectivity, water quality, and aquatic habitat from the Project affected stream reaches downstream to the Sacramento River, Sacramento-San Joaquin River Delta, and San Francisco Bay to the Pacific Ocean. This task requires that the Service obtain, review, and interpret information regarding Project effects in several resource areas: watershed hydrology; water quality; fluvial geomorphological processes (including supply, transport, and storage of coarse sediment and large woody debris); the distributions and abundances of aquatic, semi-aquatic, and riparian biota, as well as species dependent upon these biota (*e.g.*, the bald eagle); the availability of suitable habitat, expressed as a function of discharge, for affected species; and the compatibility of recreational uses with the habitat conditions required by fish and wildlife.

To achieve the conservation and enhancement goals of watershed ecosystem restoration, the Service has the following objectives:

1. Seek FERC license conditions, protection, mitigation and enhancement (PM&E) measures that sustain normal ecosystem functional processes. These may include conditions that mimic the natural unimpaired hydrologic and hydraulic patterns, and geomorphic processes such as sediment transport, channel maintenance, channel feature diversity and complexity, and chemical/physical characteristics, such as water temperature, nutrient transport, and water quality (chemical constituents). Maintaining these functional processes during the term of the new license will in turn provide the habitat to support healthy fish and wildlife populations.
2. Support integrated watershed management, specifically integration of FERC licenses with the concurrent State Water Resource Control Board (SWRCB) Regulatory Proceedings in the Sacramento River Basin.
3. Data collection and reporting consistent with the Service's draft Comprehensive Assessment and Monitoring Program (CAMP) Implementation Plan, and CAMP Rotary Screw Trap (RST) protocol (Enclosures A and B).

4. Prevent take of bald eagles (*Haliaeetus leucocephalus*) resulting from Project-related activities.
5. Conserve native frog species protected under the ESA.
6. Include license conditions that sustain normal ecosystem functional processes and that are consistent with federal and state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project (§10(a)(2) of the Federal Power Act, 16 U.S.C. section 803(a)(2)(A)). License conditions should mimic the natural unimpaired hydrologic and hydraulic patterns, and maintain geomorphic processes such as sediment transport, channel maintenance, channel feature diversity and complexity, and chemical/physical characteristics, such as water temperature, nutrient transport, and water quality (chemical constituents). Maintaining these functional processes during the term of the new license will in turn provide the habitat to support healthy fish and wildlife populations.

The Service encourages implementation of an adaptive management strategy that allows for continued evaluation and adjustment of measures over the term of the license, to maintain the desired level of protection for fish and resources and to meet the goals and objectives outlined above. The adaptive management approach is particularly appropriate where there are insufficient data and uncertainties about those measures that will be most effective for meeting ecosystem goals and objectives. This is consistent with the adaptive management strategy for Protection, Mitigation, and Enhancement measures being implemented successfully on several Commission licenses recently issued in California, *e.g.*, Lower Mokelumne River (FERC #2916), Rock Creek-Cresta (FERC #1962), and Mokelumne River (FERC #137). These licenses required the establishment of a technical assistance group to assist the Applicant in developing and implementing post-license specific measures and monitoring performance of those measures over the term of the license. These licenses include resource tools available to the Applicant and the technical assistance group, such as blocks of water, flexible flow schedules, funding and other tools for real time monitoring, and responsive actions to improve resource protection.

General Comments on PAD

Species Occurrence

The PAD provides a list of fish, wildlife, and plant species that occur or have the potential to occur within the Project area and whether they are known to occur based on The Applicant's research conducted for the PAD. One of the resources utilized by the Applicant to obtain species occurrence information was the California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB; CDFW 2016a). The CNDDB is not a complete database and does not provide a comprehensive list of which species occur where in California. The absence of a species occurrence record in CNDDB does not imply the species does not occur within the Project area, especially if suitable habitat is present. Some fish, wildlife, and plant species listed in the PAD as not known to occur may actually occur within the Project area. The Service anticipates working with the Applicant to develop study plans to determine the occurrence of species that may be affected by the Project.

Project Effects

The Applicant indicates that the only portion of the Bear River directly affected by the Project is the 1.3 miles of the lower Bear River from Camp Far West Dam at River Mile (RM) 18.2 downstream to the non-Project diversion dam at RM 16.9 (Table 3.1-1). Table 3.1-1 further implies that the Bear River reach downstream of RM 16.9 and the "non-Project Diversion Dam" to the confluence with the Feather River is cumulatively affected by the Project rather than directly affected. However, Article 29 of the current FERC license for the Project specifies instream flows that must be released from the Project to protect and enhance the fishery resources in the Bear River below the diversion dam. Further, Section 2.1.4.3 of the PAD indicates that minimum instream flows are required during non-irrigation season.

Since minimum instream flows specified in Article 29 of the current FERC license govern flow in the reach downstream of the afterbay/diversion during non-irrigation season, the Service considers this reach to be directly affected by Project operations and consequently recommends FERC and the Applicant to consider the reach of the Bear River to the confluence of the Feather River as "directly affected" not just "cumulatively affected" by the Project.

Prior to construction of the Project, the Bear River historically supported a substantial Chinook salmon (*Oncorhynchus tshawytscha*) run (Reynolds et al. 1993). The current upstream limit of anadromous fish access in the Bear River is SSID's diversion dam, approximately 17 miles upstream from the confluence with the Feather River. The lower Bear River continues to support remnant and/or "stray" wild and/or hatchery sustained salmon, and in the past it supported both steelhead and sturgeon as well (NMFS 2014). Inadequate streamflow in the Bear River prevents the establishment of a self-sustaining steelhead population (JSA 2004 as cited in NMFS 2014). The present system of diversions results in abnormal flow fluctuations, in contrast to historical natural seasonal flow variations.

In addition to inadequate flows, Camp Far West Dam and associated diversion dam have limited gravel and large wood recruitment and transport to the lower Bear River for many years. Camp Far West Reservoir is relatively shallow and may not be able to provide releases or throughflows when needed (i.e., during late summer and early fall) at water temperatures that are suitable to salmonids downstream; the result will depend upon the particular reservoir storage and mixing, as well as the volume, timing, source, and temperature of inflows and Project operation. Due to the past accumulation of mining sediments and the presence of overly constrictive levees, the lower Bear River has become narrow and incised and harbors populations of invasive and non-native species, exacerbating poor habitat conditions.

Specific Comments on PAD

Sturgeon

The southern distinct population segment (DPS) of North American green sturgeon (*Acipenser medirostris*), is listed as threatened under the ESA (April 7, 2006; 71 **FR** 17757), and its range extends into the FERC Boundary and the affected reach downstream of the Project. In addition white sturgeon (*Acipenser transmontanus*), are a California species of special concern and may also occur within the affected reach.

Adult sturgeon have been periodically observed in the Bear River during the spring in most wet and some normal water years (USFWS 1995). Specifically, adult sturgeon were observed in shallow pools in the river between the Highway 70 and 65 Bridges during 1989, 1990, and 1992. During 1989, approximately 100 sturgeon were found trapped in pools in the lower Bear River and at least 30-40 of these sturgeon (ranging in weight from 60 to 100 lbs and measuring at least five feet in length) were poached from these pools during a 2-week period in July (Beamesderfer et al. 2005). Further, recreational fishermen have reported capturing sturgeon in the Bear River below the Highway 65 Bridge and near the confluence with Dry Creek (Department unpublished creel data) and USFWS (1995) concluded that evidence suggests that sturgeon reproduction occurs in both the Feather and Bear Rivers.

The PAD provides very little information on the occurrence of green and white sturgeon in the lower Bear River, yet the PAD concludes that green and white sturgeon are not affected by operations and maintenance of the Project. Considering that sturgeon reproduction is affected by flows, this is a serious omission. The Service requests that the Applicant add both green and white sturgeon to the list of special-status fish species that occur in the lower Bear River. Additionally, the Service requests that the Applicant conduct a study to assess sturgeon distribution, spawning, and rearing within the Lower Bear River. The information gained from this study will be used to assess Project affects to the species. A study request is included as Enclosure C.

Steelhead

The California Central Valley steelhead trout (steelhead, *Oncorhynchus mykiss*) DPS is federally listed as threatened under the ESA (January 5, 2006; 71 **FR** 834), and the listing was reaffirmed by the National Marine Fisheries Service (NMFS) in 2015 (February 6, 2015; 80 **FR** 6685). Steelhead were documented in the lower Bear River in 1981 (CDFG 1981). Table 3.2.3-1 of the PAD acknowledges that steelhead are native to the Bear River watershed. The Service requests that the Applicant add steelhead to the list of special-status fish species that occur in the lower Bear River.

Chinook Salmon Stranding

On page 2-27, the PAD indicates that the Applicant, DWR, and the Camp Far West Irrigation District (CFWID) entered into the Bear Agreement (DWR, SSWD and CFWID 2000) in February 2000. This agreement was incorporated SSWD's water rights in July 2000 by the SWRCB Order 2000-10, and included the following:

> During releases of water in connection with the change of purpose of use and place of use of up to 4,400 acre-feet transferred to DWR during dry and critical years, Licensee shall increase flows in the lower Bear River by no more than 37 cfs from July through September. To avoid stranding impacts to anadromous fish in the Bear River below Camp Far West Reservoir, Licensee shall, by the end of a release period from the reservoir in connection with said change, ramp down flows from the reservoir at a rate not to exceed 25 cfs over a 24-hour period.

No additional information is given in the PAD describing historical or future potential stranding of anadromous fish. The Service requests that the Applicant provide any historical information available on stranding in the lower Bear River for all life stages of anadromous fish (as applicable).

Additionally, on page 3.2.3-35, the PAD includes recommendations CDFW made in 1991 for the lower Bear River in regards to instream flows for Fall-run Chinook salmon. These flow recommendations were for minimum flows for adult migration, spawning, redd development and fry incubation, rearing habitat, and juvenile outmigration. However, the PAD does not include any information on whether these recommendations were implemented. The Service requests additional information from the Applicant discussing how the Project has implemented these recommendations.

Chinook Salmon—Juvenile Survival

Project operations are such that juvenile salmonid rearing habitat is compromised downstream of the Project due to: (1) Warm water conditions that support predators that make it difficult for juvenile salmonids to safely migrate downstream or to rear in the river; (2) limited floodplain rearing habitat caused by regulated flows; (3) poor riparian conditions due to lack of floodplain connectivity, low input of marine derived nutrients due to decreased salmonid abundance (Cederholm et al 1999) (Scheuerell et al 2005), and very low levels of littoral drift because woody material is held back by the Project and afterbay/water-diversion pool downstream of Camp Far West Reservoir; (4) the narrow strip of existing riparian habitat does not provide the wide, slow flow conditions that would maximize retained littoral in the floodplain or optimal juvenile rearing habitat.

Fundamental information is needed on the survival of juvenile Chinook salmon, and such information can be used to infer Project effects on fall-run and spring-run Chinook salmon, Central Valley steelhead trout (*O. mykiss*), and green sturgeon. The Service recognizes that Rotary Screw Traps (RST) are costly to operate, so we recommend that the Applicant work with CDFW and coordinate on CDWF's trapping effort to minimize cost and avoid duplicative effort. A study plan is included as Enclosure D.

Sediment, Gravel, and Large Woody Material Transport

Physical habitat such as large woody material (LWM) and coarse spawning substrate and other sediments are vital to the freshwater life-stages of anadromous species as well as many other native species that depend upon the Bear River for their life history. The PAD does not adequately examine the Project's full effects on these important physical habitat components. In general, there is a lack of qualitative information regarding current and historic frequency of LWM in Camp Far West Reservoir and the lower Bear River.

The PAD states that "In most years, SSWD collects no large woody material (LWM) from the surface of Camp Far West Reservoir. Little LWM enters the reservoir from upstream and the reservoir shoreline has very little LWM" (PAD pg. 3.2.1-22). The PAD contains no supporting documentation for this assertion. The lack of observed LWM could be a result of few pieces of LWM being supplied to the reservoir, or simply a lack of observations that would document its occurrence.

The PAD does not address how many miles of former riparian habitat is inundated by Camp Far West reservoir and how this may have affected LWM supply to downstream areas in light of other factors.

SSWD conducted habitat surveys of the lower Bear River in advance of the relicensing and included parts of the results in the PAD. These surveys covered 35% of the lower Bear River; there was no explanation regarding SSWD's decision to subsample the lower Bear River or the sampling protocol. As shown in figure 3.2.1-8 of the PAD, the subsections of the Bear River that were surveyed include very little of the habitat directly below the Diversion Dam which is the habitat that is most likely to be affected by the Project and associated structures. Because only 35% of the lower Bear River was surveyed, the conclusions reached in the PAD regarding LWM in the lower Bear River cannot be extrapolated to apply to the entire 17 miles of the lower Bear River. The SSID did not provide the methods they used for sub-sampling the lower Bear; therefore it is unclear whether the 35% sampled accurately represents the entire lower River.

The PAD does not effectively characterize the Project's effect on gravel supply and transport in the lower Bear River. Camp Far West Dam and associated diversion dam have effectively trapped all spawning sized gravel from moving downstream, creating a sediment deficit below the diversion dam.

"Although flows may be sufficient for CV steelhead embryo incubation during the years when they are able to spawn in the Bear River, reports that physical habitat conditions in the Bear River below Camp Far West Reservoir currently are not suitable for the natural production of anadromous fish, including CV steelhead. Salmonid spawning is reportedly severely limited due to silted spawning gravel in the Bear River (NMFS 2014)." Although the Applicant proposes to collect further information regarding steelhead spawning gravels, the proposed study will not characterize the Project's effect on gravel permeability, nor characterize all of the habitat directly below the diversion dam which has been deprived of gravel since the Dams' construction in 1925.

The PAD does not include any information or discussion on how other sediments are affected by Project operations and maintenance. This would include fine sediment, among others.
A LWM and Sediment study plan is included as Enclosure E.

Benthic Macroinvertebrates

The PAD concludes that the Bear River is a warm-water system with a very low species diversity and quantity of individuals of benthic macroinvertebrates (BMI) based on a 2014 study in which BMI were "collected and identified" in the Bear River and an additional sample that was collected upstream of Camp Far West Reservoir tin 2013. The Applicant concludes that the Bear River upstream of Camp Far West Reservoir near Little Wolf Creek has a diverse assemblage of BMIs, but is a more stressed warm water system due to the specific taxa collected.

The Applicant does not provide information in the PAD regarding the location or sampling methodology of the BMI study conducted in 2014. Additionally, biological scoring using BMI metrics to assess stream health was not completed for the 2014 study. The Applicant's description of the 2014 study in the PAD implies that a complete BMI study following standard State protocols (Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California (Ode 2007)) and appropriate analysis of the data collected was not conducted. The Service does not agree with the conclusions drawn by the Applicant that the 2014 study suggests "a more stressed warm-water system" as the study did not include any biological scoring using BMI metric calculations to support this determination. Biological scoring using BMI metrics is to be performed with data collected during

BMI community structure studies to measure overall stream health. Since BMI metrics were not calculated during the 2014 study, it is not appropriate for the Applicant to compare the Bear River's BMI community structure and corresponding overall stream health with other local rivers. The 2013 BMI sample referenced by the Applicant was collected upstream of the Project and Camp Far West Reservoir and does not provides any insight into the condition of the BMI community in the Bear River downstream of the Project and reservoir. Therefore, the Service does not have enough information from the 2014 BMI study and 2013 BMI sample to determine the current BMI community structure in the lower Bear River downstream of the Project and determine how Project operations and maintenance activities may affect this BMI community.

The Service recommends that the Applicant use standard State protocols to conduct a BMI study that includes an analysis of overall stream health in the lower Bear River from Camp Far West Dam to the confluence with the Feather River. Information collected during the study will be utilized by the Applicant, the Service, and other relicensing participants to understand the current BMI community structure in the lower Bear River and determine if the BMI community is affected by Project operations and maintenance. A study request is included as Enclosure F.

Bats

The PAD indicates that five special-status bat species may have the potential to occur in the Project area, including: pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), western mastiff bat (*Eumops perotis*), and western red bat (*Lasiurus blossevillii*) (Table 3.2.4-5). All of these species are California Species of Special Concern and additionally Townsend's big-eared bat is a candidate species for listing under California Endangered Species Act (CESA). The Applicant states in the PAD that pallid bat, spotted bat, and western mastiff bat are not known to occur in the Project area, but potentially occur in suitable habitat. Additionally, the Applicant states that for Townsend's big-eared bat and western red bat "neither the species or suitable habitat was observed during BA surveys (Sycamore and Associates 2013a)."

The Service does not agree that the Project area does not contain suitable habitat for Townsend's big-eared bat and western red bat. Further, the Project area contains suitable habitat for all five of the special status bat species identified in the PAD and thus all five bat species have the potential to occur in the Project area. Specifically:

- Pallid bats are known to roost in bridges, buildings, and trees, including oaks and deciduous riparian trees (WBWG 2016). Potentially suitable habitat for pallid bats in the Project area includes the bridge over the dam, recreation buildings (bathroom and stores), the powerhouse, other Project buildings, and vegetation types that include oaks and deciduous riparian tree species such as Blue Oak Woodland/Forest Alliance, Interior Live Oak Woodland/Forest Alliance, Foothill Pine Woodland/Forest Alliance, California Buckeye Woodland/Forest Alliance, Fremont Cottonwood Woodland/Forest Alliance, and Red Willow Woodland/Forest Alliance.
- Townsend's big-eared bats are known to roost in buildings and bridges and forage along streams and in a variety of wooded habitats (WBWG 2016). Potentially suitable habitat for Townsend's big-eared bats in the Project area includes the bridge over the dam, recreation buildings, the powerhouse, other Project buildings, streams such as the Bear River upstream of Camp Far West Reservoir and downstream Camp Far West Dam, and wooded vegetation alliances such as Blue Oak Woodland/Forest, Interior Live Oak Woodland/Forest, Foothill

Pine Woodland/Forest, California Buckeye Woodland/Forest, Red Willow Woodland/Forest, and Fremont Cottonwood Woodland/Forest.

- Spotted bats have been found in various vegetation types, including riparian areas and fields (WBWG 2016). Potentially suitable habitat for spotted bat in the Project area includes riparian vegetation alliances such as California Buckeye Woodland/Forest Alliance, Fremont Cottonwood Woodland/Forest Alliance, and Red Willow Woodland/Forest Alliance. Additional potentially suitable habitat for spotted bat in the Project area includes fields containing annual and perennial grasslands.
- Western mastiff bats are known to roost in buildings and forage in oak woodland, and grassland (WBWG 2016). Potentially suitable habitat for western mastiff bats in the Project area includes recreation buildings, the powerhouse, other Project buildings, and Blue Oak Woodland/Forest, Interior Live Oak Woodland/Forest, and annual and perennial grassland vegetation alliances.
- Western red bats are known to roost in trees and shrubs adjacent to streams or open fields and in riparian areas (WBWG 2016). Potentially suitable habitat for western red bat in the Project area includes all wooded and riparian vegetation alliances, including Blue Oak Woodland/Forest, Interior Live Oak Woodland/Forest, Foothill Pine Woodland/Forest, California Buckeye Woodland/Forest, Fremont Cottonwood Woodland/Forest, and Red Willow Woodland/Forest.

The protocols followed in the 2013 study by Sycamore and Associates (referenced by the Applicant in the PAD as a source of information regarding the presence of special status bat species and their habitat in the Project area) were not sufficient to adequately determine how special-status bat species may be using the Project area. The Service recommends that the Applicant not rely on this study to determine the presence of special status bat species within the Project area.

The Applicant indicates in the PAD that an evaluation was done in September 2015 at all Project recreation facilities within the Project area for evidence of bat activity. This evaluation concludes that there is no bat activity within the Project area. However, the protocols followed in this evaluation were insufficient to adequately determine how special-status bats may be using the Project area.

In the Service's view, the Project area contains suitable habitat for five special-status bats species (based on life history and known Project habitat types): pallid bat, Townsend's big-eared bat, spotted bat, western mastiff bat, and western red bat. Therefore, these species have the potential to occur in the Project area and may be adversely affected by ongoing Project operations, maintenance, and recreational activities. The Service has provided specific recommendations on Study Plan 4.3 Special-Status Wildlife, Bats, to adequately determine the presence of special-status bats in the Project area, determine the use of Project facilities by bats, and evaluate potential Project effects to special-status bats related to ongoing Project operations and maintenance activities and recreational use.

California Red-legged Frog

The Service has concerns regarding potential Project effects to the California red-legged frog, which is listed as threatened under the ESA (61 FR 25813; May 23, 1996).

On page 3.2.5-13 of the PAD, the Applicant states that "No records of California red-legged frog were found within the Project Vicinity in the CNDDB search." As stated previously in this letter, the CNDDB occurrence information is not suitable for making a determination that a species does not occur in the Project area. The habitat description in Table 3.2.5-1 does not adequately reflect the habitat utilized by the species. In a site visit on June 27, 2016, Service staff noticed potential California red-legged frog (*Rana draytonii*) habitat within the FERC Boundary. The Service requests that the Applicant add the California red-legged frog to the list of special-status species that could occur within the FERC Boundary.

Reservoirs can have adverse effects on California red-legged frogs, because: (1) they are typically populated with bullfrogs (*Rana* [=*Lithobates*] *catesbeiana*) and warm water fishes that feed on California red-legged frogs; (2) bullfrogs tend to disperse out of reservoir habitat into stream and pond habitat occupied by California red-legged frogs; (3) California red-legged frogs move up and down drainages and seek out water bodies with permanent water, which brings them into predator infested water.

Hydroelectric project dams, impoundments, afterbays, and changing of aquatic conditions are key factors in the establishment of bullfrogs. Hydroelectric projects enhance habitat conditions for the bullfrog at the expense of native amphibians. Diversion dams also create warm water conditions that allow for establishment of bullfrog populations in areas where they would not exist, or would be in very low numbers, under natural flow conditions (Fuller *et al.* 2010). The USFWS is concerned that the Project provides conditions that favor bullfrog establishment, either extirpating local California red-legged frog populations or putting constant pressure on California red-legged frog populations and keeping their numbers low.

Bullfrogs are well-known invasive, non-native predators that eat and compete with native frogs, such as the California red-legged frog. At the time of ESA-listing of the California red-legged frog, non-native bullfrogs were "considered to be a significant and widespread threat" (USFWS 1996). Introduced bullfrogs have been, and continue to be, a significant factor in the decline of the California red-legged frog (USFWS 1996, USFWS 2006). In spite of the population pressures that bullfrogs place on them, California red-legged frogs are typically able to persist: (1) In sub-optimal habitat where conditions are unfavorable to bullfrogs; (2) in marginal habitat adjacent to bullfrog-occupied areas; (3) where habitat is managed to reduce establishment of bullfrogs; or (4) where bullfrog depredation has been implemented. In areas where bullfrogs and California red-legged frogs co-occur, surveys typically detect high numbers of bullfrogs and low or undetectable numbers of California red-legged frogs. In these same areas, bullfrog removal and/or management have led to resurgence in the California red-legged frog population. Fortunately, California red-legged frog populations respond well to bullfrog control (USFWS 2006). In the same four types of habitat areas listed previously, bullfrog removal and/or management have led to resurgence in the California red-legged frog population.

Bullfrogs were introduced into California over a century ago, in response to commercial overharvest of California red-legged frogs. At the time of ESA-listing of the California red-legged frog, bullfrogs were "considered to be a significant and widespread threat" (USFWS 1996). Several researchers in central California have noted the decline and eventual disappearance of California red-legged frogs once bullfrogs become established at the same site (Jennings and Hayes 1990, Moyle 1973, Fisher and Schaffer 1996). Bullfrogs prey on California red-legged frogs (Twedt 1993), and may have a competitive advantage over California red-legged frogs because of their larger size, generalized food

habits (Bury and Whelan 1984), and extended breeding season (Storer 1925) that allows for production of two clutches of up to 20,000 eggs during a breeding season (Emlen 1977). We enclose Finkle (2012) and Fuller *et al.* (2010) (Enclosures G and H) for consideration by the Commission regarding Project effects on California red-legged frogs from operations that support bullfrog establishment and dispersal.

Bullfrogs have a high dispersal capacity. Habitat or life-history changes, such as water drawdown or metamorphosis, affect bullfrog behavior and can trigger dispersal. Two types of bullfrog dispersal events are likely to occur within the FERC Project Boundary. The first is dispersal of juvenile bullfrogs following their spring metamorphosis period. If the conditions are optimal, thousands of bullfrog metamorphs/juveniles are likely to disperse from bullfrog breeding habitat into California red-legged frog habitat of all types. The second type of dispersal occurs when water levels drop and adult bullfrogs disperse away from breeding habitat. This second type of dispersal event is likely to be a greater stressor on local California red-legged frog populations, because adult bullfrogs prey upon California red-legged frogs and outcompete them for food resources. Adult bullfrogs also stimulate false-breeding attempts in California red-legged frogs, which reduce individual reproductive fitness.

The Service recognizes that some of the ponded water in the vicinity of the Project, and within the FERC Boundary, may be considered marginal or poor quality for California red-legged frogs. However, because California red-legged frogs often persist in marginal habitat adjacent to bullfrog-occupied areas, it is premature to conclude that marginal habitat would not be occupied by California red-legged frogs. Lack of records on California red-legged frog occurrence does not equate to the species not being present. If bullfrog dispersal is not quantified, it is premature to conclude that the Project will not affect California red-legged frogs within the 1-mile action area boundary. Project operations, including promoting conditions that support bullfrog establishment and dispersal, may affect California red-legged frogs.

Based on life history requirements of the species and known Project habitats, potential habitat is present within the Project area and California red-legged frog may be affected by the Project. The Service has developed an efficient methodology for California red-legged frog surveys described in Enclosure I, but would consider working with the Applicant to further reduce the cost of the study by assisting in some aspects of it.

Study Recommendations

General Comments on the Applicant's Study Plans

The Service requests that the Applicant host meetings to discuss and develop the Project study plans collaboratively with Project relicensing participants. These meetings will allow the Applicant and Project relicensing participants to come to agreement on study plans more quickly and efficiently prior to the Applicant finalizing the study plans.

Study Plan 2.1 Water Temperature Monitoring

The Applicant is proposing Study 2.1 – Water Temperature Monitoring to provide information to determine whether continued Project operations and maintenance have an adverse effect on water temperature. The Service has the following comments and recommendations for this plan:

The Applicant proposes to collect stream water temperature data at two locations upstream of the Project area in the Bear River and Rock Creek and at ten locations downstream of the Project area, seven of which are in the Bear River, one in Dry Creek, and the remaining two in the Feather River. The Applicant will also collect reservoir water temperature profile at three locations in Camp Far West Reservoir. The Applicant installed temperature recorders in these locations in 2015 and proposes to continue collecting data through 2016.

The Service agrees with Water Temperature Monitoring and recommends that the Applicant continue to collect water temperature data at all stream and reservoir locations through 2017 in order to overlap with the timing of other relicensing studies and accumulate more data for the proposed Study 2.2 – Water Temperature Modeling Study. The results of Study 3.1 – Salmonid Redd Study, Study 3.2 – Stream Fish Populations Study, and other studies to be conducted during 2017 involving the survey of aquatic resources may need to be compared to the results of Study 2.1. Spot water temperature data collected during other Project relicensing studies will not be sufficient when analyzing trends and spatial distribution of water temperature throughout the entire lower Bear River. Extending the water temperature data collecting period through 2017 will provide Project relicensing participants with close to three years of data to compare water temperatures during a range of variable hydrologic conditions.

The requested modifications to Study 2.1 of extending collection of water temperature data described above will provide the information needed to determine whether continued Project operations and maintenance have an adverse effect on water temperature.

Study Plan 2.2 Water Temperature Modeling

The Applicant is proposing Study 2.2 – Water Temperature Modeling Study to determine if Project operations and maintenance adversely affects water temperature in Camp Far West Reservoir and in the Bear River downstream of Camp Far West Dam. The Service requests that the Applicant revise Study 2.2 to incorporate the comments and recommendations provided below.

For Study 2.2, the Applicant proposes to use only one year of data for the calibration period of the water temperature model. The proposed period of calibration is listed as April 2015 through March 2016. The Service requests the Applicant use the water temperature monitoring and meteorologic data collected through the end of 2016 in the calibration of this model. The hydrologic year of 2015 came at the end of one of the driest periods on record in California. Conversely, the hydrologic year of 2016 has been wetter than 2015. The Service does not believe one (dry) year of water temperature data presents a wide enough range of hydrologic conditions to develop a robust calibration.

The Service recommends inclusion of additional water temperature modeling data (data collected through the end of 2016) for water temperature model calibration purposes. Including this additional data should not delay this schedule any further than it has already been delayed by Project pre-filing activities. Thus, water temperature data through 2016 can and should be included in the model calibration.

The Service believes the requested modifications to Study 2.2 described above will provide the information needed to determine if Project operations and maintenance adversely affects water

temperature in Camp Far West Reservoir and in the Bear River downstream of Camp Far West Dam.

Study Plan 3.1 Salmon Redd Survey

The stated goal and objective of the study is to determine if Project operations and maintenance has an adverse effect on anadromous fish in the lower Bear River and to collect information in support of that goal. While the Service supports this goal and objective, it is very general and the Service agrees with the conclusion drawn by CDFW in their August 25, 2016 comment letter on the PAD. CDFW recommends alternative goals and objectives:

1. assess spawning of salmonids (Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead) in the lower Bear River;
2. evaluate how flows released from Camp Far West Dam affect salmonid spawning activities and related aquatic habitat conditions in the lower Bear River; and
3. determine if Project operations and maintenance have an adverse effect on anadromous fish in the lower Bear River.

The Service agrees that these goals would appropriately support a redd survey in the lower Bear River. CDFW also states that the following methods should be employed:

- Describe the temporal and spatial spawning distribution of Chinook salmon and steelhead in the lower Bear River downstream of the non-Project diversion dam;
- Identify and describe habitats utilized for spawning by salmonids;
- Examine potential relationships between the spatial and temporal distribution of steelhead spawning, and abiotic factors including flow and water temperature;
- Characterize the size and shape of salmonid redds;
- Obtain salmonid spawning microhabitat utilization data; and
- Provide an estimate or index of salmonid spawning abundance.

The Service recommends that the Applicant utilize the primary criteria established by Gallagher (2007). Using the protocols included in these criteria, the Applicant would conduct redd surveys less than fourteen days apart throughout the spawning run (Gallagher and Gallagher 2005, Gallagher 2007). Specifically, surveys should begin prior to the onset of spawning of the species of interest and continue at least biweekly until spawning is complete. Redd count surveys should include marking newly made redds and recounting marked redds to estimate observer efficiency and reduce counting errors.

The Service supports the recommendations made by CDFW in their August 25, 2016 PAD comment letter on assessing species redd occurrences. CDFW recommends on page 17 that the Applicant "...collect physical measurements of the pot area and tail spill of each newly constructed redd. Total area of the redd should be calculated from the field measurements treating the pot as a circle or ellipse and the tail spill as a square, triangle, or rectangle depending on the individual measurements." CDFW indicates that this information can be used to reliably determine if the redd is Chinook salmon or steelhead.

The Service also acknowledges the recommendations made by the NMFS in their August 25, 2016 PAD comment letter regarding protocols and methods for redd surveys. The Service requests that the Applicant continue to refine this study under consultation with the resource agencies through the previously recommended study plan meetings.

Study Plan 3.2 Stream Fish Populations Survey

The Applicant is proposing Study 3.2 – Stream Fish Populations Study to determine if Project operations and maintenance has an adverse effect on fisheries in the Bear River downstream of Camp Far West Dam. The Service requests the Applicant revise Study 3.2 to incorporate the comments and recommendations provided below.

For Study 3.2, the Applicant is proposing to conduct stream fish population surveys in the Bear River below Camp Far West Dam in four reaches: Camp Far West Dam downstream to the non-Project diversion dam (Reach 1), within one mile downstream of the diversion dam (Reach 2), within 0.5 miles of the Highway 65 Bridge (Reach 3), and within 0.5-mile of the Highway 70 Bridge (Reach 4). For Reach 1, the Applicant proposes to split the reach into three sites and conduct qualitative electrofishing surveys once during spring and once during the fall. For Reaches 2-4, Licensee proposes to conduct snorkel surveys once in the spring and once in the fall.

The Service has the following comments and recommendations regarding the Applicant's proposal to survey stream fish populations in the Bear River below Camp Far West Dam:

- The Applicant's proposal to sample each reach once during spring and fall does not provide adequate opportunity to sample the species and lifestages of special status species that are expected to occur in the Bear River below Camp Far West Dam, including, but not limited to: fall- and late fall-run Chinook salmon, both NMFS Species of Special Concern; steelhead, a federally threatened species; white sturgeon, a California Species of Special Concern; green sturgeon, a federally threatened species; hardhead (*Mylopharodon conocephalus*), a California Species of Special Concern; and California roach (*Lavinia symmetricus symmetricus*), a California Species of Special Concern. The Service recommends stream fish sampling via electrofishing in Reach 1 and snorkel surveys in Reach 2-4 be increased from once during the spring and fall to once per month during April, May, and June, and then October, November, and December. Sampling during three spring months will increase the likelihood of observing juvenile salmonids (salmon and steelhead) and adult sturgeon. Sampling during three fall months will increase the likelihood of observing adult salmonids.
- The Service requests the Applicant provide more detail in the study plan to clarify whether the study is intended to be qualitative (i.e., presence/absence) or quantitative (i.e., catch per unit effort).
- The Service is concerned that snorkel surveys alone may not be adequate for conducting population surveys in Reaches 2-4. Decreased water visibility during snorkel surveys reduces the number of fish observed by surveyors. The Service recommends the Applicant supplement snorkel surveys with beach seining once per month during the three spring months and the three fall months. The Applicant should utilize a seine net with the appropriate mesh size to capture juvenile and adult special status fish species during the respective sampling periods (spring and fall). Supplementing snorkel surveys with beach seining will allow the Applicant to collect information about individual fish in Reaches 2-4, including confirmation of species, length, weight, estimated age, and condition.

- The Service requests the Applicant collect Environmental DNA (eDNA) during Study FWS-2 to assist in determining the occurrence of differentiation of salmon runs in the lower Bear River. We did not include this request in the study, in order to avoid confusion about the purpose of Study FWS-2. The Service would like to collaboratively determine the locations, timing, and methodology for eDNA sampling with the Applicant and other Project relicensing participants during a study plan meeting. General information on eDNA sampling can be viewed at https://pubs.usgs.gov/fs/2012/3146/ (Pilliod et al 2012) and is included as Enclosure J.
- The Applicant proposes to visually estimate turbidity as low, moderate, or high during electrofishing surveys. The Service believes visual turbidity measurements are too subjective and requests the Applicant utilize a secchi disk to measure turbidity prior to each electrofishing sampling event.

All persons conducting stream fish population surveys in the Project area must be: 1) able to identify fish species expected to occur in the Bear River below Camp Far West Dam; 2) knowledgeable of the life history, behavior, and habitat requirements of the fish species being surveyed; 3) experienced in conducting snorkel and electrofishing surveys; and 4) experienced in collecting data on sampled fish.

The Service believes the requested modifications to Study 3.2 described above will provide the information needed to determine which stream fish, including special-status species, occur in the Bear River below Camp Far West Dam and how they may be affected by Project operations and maintenance.

Study Plan 3.3 Instream Flow Study Plan

The Applicant is proposing Study 3.3 – Instream Flow Study to determine if Project operations and maintenance affects habitat for fishes in the Bear River downstream of Camp Far West Dam. The Service has included the following comments and recommendations pursuant to this plan.

The Applicant proposes two study sites for preliminary information review and state that they will select final study site locations. The Service requests that site selection for Study 3.3 be performed in consultation with the Service and other interested Project relicensing participants, including, but not limited to NMFS, CDFW, and the State Water Resources Control Board (SWRCB).

The Service requests that in addition to utilizing results from the Habitat Suitability Criteria (HSCs) for potential modeling for fall-run Chinook salmon and hardhead, the Applicant consult with the Service and other interested Project relicensing participants.

The Applicant indicates that the HSC could require modifications for use in the lower Bear River. The Service recommends that should any modifications be deemed necessary to the existing HSCs, they should be discussed and agreed upon in consultation with technical staff from the Service and other Project relicensing participants.

In their PAD comment letter, CDFW suggests the installation of data loggers at no less than four locations in the lower Bear River for at least one calendar year. The Service concurs with this recommendation and suggests the Applicant implement this measure in consultation with the Service and other interested Project relicensing participants.

4.2 Special Status Raptor Studies

The Applicant is proposing to survey for bald eagle, golden eagle, and Swainson's hawk using established protocols as cited in the study plan. The Service recommends that the Applicant survey for bald eagles and golden eagles that might be nesting or roosting within one mile of Camp Far West reservoir, or within line of sight of the reservoir and facilities. Project activities may affect these species within this footprint, especially if the trees utilized by the eagles are within line-of-sight of the reservoir or Project facilities.

The Service recommends that the Applicant ensure that these studies are performed by qualified avian biologists who have experience with eagle surveys and actions that can potentially disturb individual eagles. The Service requests that the raptor studies be fully developed in consultation with the Service and other interested Project relicensing participants and that the Service be notified of potential survey dates at least two weeks prior to field work for eagles.

The Applicant indicates that for bald eagle, surveys will take place in areas previously known to support the species; however, the Service recommends that the Applicant extend the bald eagle survey to any suitable habitat within the Project area and any suitable habitat within line-of-sight of Project facilities, up to one mile.

The Service requests that further development of the special status raptor surveys be conducted in consultation with the Service and other interested Project relicensing participants at the previously mentioned study plan meetings.

Study Plan 4.3 Special Status Species—bats

The Service agrees with CDFW in their PAD comment letter stating that "...we do not believe the evaluation conducted by the Applicant was adequate to determine use of Project facilities by bats and whether bats are present within the Project area" (page 25). The Service also concurs with the recommendations made by CDFW on pages 25 through 27, including those made regarding the long-term acoustic monitoring and qualifications of surveyors, and requests the Applicant incorporate all suggestions made by CDFW in their August 25, 2016 letter regarding bats.

Study Plan 5.3 ESA Listed Amphibians: California Red-legged Frog

The Service has reviewed Study Plan 5.3 and appreciates the efforts of the Applicant to address potential affects to the species within the Project area. However, the Service requests that an alternative study plan be utilized to assess affects, rather than the proposed Study Plan 5.3. The Service has included this alternative study plan as Enclosure I. The Service proposed study is a very inexpensive methodology for California red-legged frog surveys, but we would consider working with the Applicant to further reduce the cost of the study by assisting in some aspects of it.

Request for Studies

To address the deficiencies of previous study designs in other drainages, and the lack of information specific to the Bear River and its tributaries, the Service is submitting the following five study requests for the Project:

- FWS-1: Sturgeon Study
- FWS-2: Juvenile Chinook Salmon Survival Study
- FWS-3: Large Woody Material and Sediment Transport Study
- FWS-4: Benthic Macroinvertebrate Study
- FWS-5: California Red-legged Frog Study

Conclusion

Additional studies of anadromous fish and their habitats in the lower Bear River, BMI studies in the upstream portion of the Project area and in the lower Bear River, as well as the various aquatic and terrestrial surveys will be used to assess the degree that each species and its habitat are being affected by the Project. This information is necessary for the development of protection, mitigation, and enhancement measures and 10(j) recommendations and for the development of mandatory conditions, and environmental analyses, as well as ESA and Fish and Wildlife Coordination Act consultations.

If you have any questions regarding this letter or our enclosed comments, please contact Leigh Bartoo at (916)930-5621.

Sincerely,

for Kaylee Allen
Field Supervisor

Enclosures
A: USFWS 1997 Comprehensive Assessment and Monitoring Program
B: PSMFC 2016. American River Rotary Screw Trap Protocol
C: FWS-1—Sturgeon Study
D: FWS-2— Juvenile Chinook Salmon Survival Study
E: FWS-3— Large Woody Material and Sediment Transport Study
F: FWS-4— Benthic Macroinvertebrate Study
G: Finkle, J. A. 2012. Effects of the North American Bullfrog on Native California Amphibians
H: Fuller, T. E., K. L. Pope, D. T. Ashton, and H. H. Welsh Jr. 2010. Linking the distribution of an invasive amphibian (Rana catesbeiana) to habitat conditions in a managed river system in Northern California
I: FWS-5— California Red-legged Frog Study
J: USGS eDNA Fact Sheet January 2013

cc:
FERC Service List, Project No. 2297
Anna Milloy, CDFW
Meiling Roddam, SWRCB
Thomas Holley, NMFS

Traci Van Thull, Foothills Water Network

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