UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
WEST COAST REGION
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4706

August 25, 2016

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

RE: NOAA's National Marine Fisheries Service, West Coast Region, Requests for Information or Study, Comments on the Applicant's pre-application Document and Proposed Studies for the Camp Far West Hydroelectric Project, Federal Energy Regulatory Commission Project No. P-2997

Dear Mr. Arnold,

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) has reviewed the Preliminary Application Document (PAD) filed by South Sutter Water District (SSWD or Licensee) for the Camp Far West Hydroelectric Project, FERC No. 2997 (Project). Under the timelines established in this Traditional Licensing Process (TLP), NMFS herein provides its comments on the PAD and the studies proposed by SSWD. NMFS' request for information or study can be found in appendices A and B.

If you have questions regarding this letter, please contact Mr. Thomas Holley at (916) 930-5592.

Sincerely,

Steve Edmondson
FERC Hydropower Branch Supervisor
NMFS, WCR, Central Valley Area Office

Appendices
cc: FERC Service Lists for P-2997

Introduction

NMFS has statutory responsibility for the protection and enhancement of living marine resources, including anadromous fish and their supporting habitats, under the ESA (16 U.S.C. §1531 *et seq*.), Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1801 *et seq*.), Fish and Wildlife Coordination Act (16 U.S.C. §661 *et seq*.), and Reorganization Plan No.4 of 1970 (84 Stat. 2090). NMFS has the authority to prescribe fish passage at licensed projects under the Federal Power Act (FPA) §18, and the duty to provide recommendations for the protection, mitigation of damage to, and enhancement of fish and their habitats under FPA § 10(j) and 10(a). NMFS submits these comments pursuant to its authorities under these statutes.

The anadromous fish and anadromous fish habitat potentially impacted by facilities and operations of the Camp Far West Hydroelectric Project (P-2997) are preliminarily determined to be those occurring in the lower Bear River watershed, including Dry Creek, and in areas downstream in the Feather River, Sacramento River, and the Sacramento-San Joaquin Delta; these resources are identified below:

Anadromous fish and habitat resources protected under the Endangered Species Act (ESA):

1) Central Valley (CV) spring-run Chinook salmon evolutionarily significant unit (ESU) (*Oncorhynchus tshawytscha*), threatened (June 28, 2005, 70 FR 37160);

2) CV spring-run Chinook salmon critical habitat (September 2, 2005, 70 FR 52488);

3) CV steelhead distinct population segment (DPS) (*Oncorhynchus mykiss*), threatened (January 5, 2006, 71 FR 834);

4) CV steelhead critical habitat (September 2, 2005, 70 FR 52488);

5) Southern DPS of North American green sturgeon (*Acipenser medirostris*), threatened (April 7, 2006, 71 FR 17757);

6) Southern DPS of North American green sturgeon designated critical habitat (October 9, 2009, 74 FR 52300);

7) CV fall/late fall-run Chinook salmon ESU, Species of Concern (those species about which NMFS has concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA): April 15, 2004, 69 FR 19975;

Anadromous fish habitat resources protected under the Magnuson-Stevens Fishery Conservation and Management Act (MSA):

1) Chinook salmon “Essential Fish Habitat” (EFH), (October 15, 2008 73 FR 60987); EFH has been identified in the Bear River extending upstream to approximately Camp

Far West Dam and in areas downstream in the Feather and Sacramento Rivers, and the Sacramento-San Joaquin Delta.

Background

Yoshiama et al. (2001) documents the historical occurrence of salmonids in the Bear River: "The Bear River, the second largest tributary to the Feather River, historically contained salmon, but evidently only a fall run. The run reportedly was "substantial" (Reynolds and others 1993) but has not occurred in its former numbers for decades (J. Nelson, personal communication, see "Notes"). Adult salmon ascended as far as present day Camp Far West Reservoir, where a waterfall in that vicinity probably barred their further passage. No waterfall exists there now, so it evidently was submerged or built upon during the construction of Camp Far West Reservoir and Dam (J. Hiskox, personal communication, see "Notes")."(pg. 117)

The current upstream limit of anadromous fish access in the Bear River is South Sutter Irrigation District'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 minimum flows released below Camp Far West (CFW) diversion dam to meet current FERC license requirements are likely to warm to support all freshwater life-stages of steelhead. However, during periods of high flows, steelhead are known to utilize the river for limited spawning (JSA 2004 as cited in NMFS 2014). Because environmental conditions do not support a self-sustaining population of steelhead in the Bear River, those steelhead that do spawn during high flow years have likely originated from the Feather River Fish Hatchery. The present system of diversions results in abnormal flow fluctuations, in contrast to historical natural seasonal flow variations. The presence of the diversion dam limits upstream migration and any habitat that may have occurred upstream of CFW dam is now inundated by the reservoir.

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 both relatively shallow and may not be able to provide releases or through-flows 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.

NMFS' *Final Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, and Central Valley Steelhead* (Recovery Plan) (NMFS 2014), classified the Bear River as a core 3 watershed for steelhead. This means that the Bear River is part of the steelhead recovery process, but it is considered a lower priority watershed. Core 3 watersheds support populations that are characterized as being small, possibly intermittent, and

dependent on other nearby populations for their existence. Although the Bear River is considered a low priority for steelhead recovery, its persistence does increase the species' viability by providing increased habitat and life history diversity and serving as a buffer against local catastrophic occurrences that could affect other nearby populations (e.g., Feather or Yuba river populations).

Endangered Species Act and Magnuson-Stevens Act Consultation

Pursuant to Section 7(a)(2) of the Endangered Species Act, as amended (16 U.S.C. §1531 et sq.) (ESA), Federal agencies are required to, in consultation with and with the assistance of the Secretary of the appropriate resource agency, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat. If the Commission determines that issuance of a hydroelectric license for the Camp Far West Hydroelectric Project may affect a listed anadromous species or its critical habitat, then formal consultation with NMFS is required. The formal consultation process culminates with NMFS issuing its biological opinion (BO) detailing how the agency action affects the species or its critical habitat. In formulating a BO, NMFS must use the best scientific and commercial data available. Procedural guidance for implementing section 7 consultations is provided in the ESA, and the regulations for implementing the ESA (50 CFR §402).

The Magnuson-Stevenson Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), establishes procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan (FMP). Pacific coast salmon stocks, highly prized by commercial, sport, and subsistence fishers, are managed by the Pacific Fishery Management Council (Council) under the Pacific Coast Salmon FMP adopted in 1999 (PFMC 2003); the managed stocks include the Sacramento River winter-run Chinook salmon (*O. tshawytscha*) Central Valley spring-run Chinook salmon (*O. tshawytscha*) and Central Valley fall- and late fall-run Chinook salmon (*O. tshawytscha*).

EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purposes of interpreting the definition of EFH, “waters” includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means habitat required to support a sustainable fishery and a healthy ecosystem; and, “spawning, breeding, feeding, or growth to maturity” covers all habitat types used by a species throughout its life cycle (50 CFR 600.10). Freshwater EFH for Chinook salmon consists of four major habitat functions: (1) spawning and incubation; (2) juvenile rearing; (3) juvenile migration corridors; and 4) adult migration corridors and adult holding habitat. Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g*., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). EFH in the Bear River has been identified upstream to Camp Far West Dam.

Pursuant to the MSA, Federal agencies must consult with NMFS on all actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under the MSA (§305(b)(2)). If NMFS receives information from a Federal agency or determines from other sources that an action would adversely affect EFH, NMFS must recommend to such agency conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

Federal agencies must provide a detailed response in writing within 30 days after receiving NMFS' EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH (MSA §305(b)(4)(B)). If the Commission's response is inconsistent with NMFS' EFH conservation recommendations, the Commission must explain its reasons for not following the recommendations.

Anadromous fishes and habitats in the Bear River, protected under the ESA and MSA that could be affected by the Project are listed above. Additional ESA and MSA resources downstream in the Bear River, Feather River, Sacramento River, Sacramento-San Joaquin Delta, and San Francisco Bay may also be affected by the Project.

Comments on the Pre-Application Document

Geology and Soils (Section 3.2.1):

Physical habitat such as large woody debris (LWD) or material (LWM) and coarse spawning substrate are vital to the freshwater life-stages of anadromous species under NMFS jurisdiction. 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 LWD in Camp Far West Reservoir and the lower Bear River:

"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 above statement in the PAD does not have any supporting documentation. 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 only 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. Therefore there is still a large information gap regarding how the project and associated structures affect spawning gravel supply and transport for use by salmonids.

"There is very little LWM in the lower Bear River channel. The highest concentration was in the section in the long pools between vertical slopes (about RM 10). LWM averages about 11 pieces/mi within bankfull." (PAD p.3.2.1-25)

Because only 35% of the lower Bear River was surveyed, the statement above cannot be extrapolated to apply to the entire 17 miles of the lower Bear River. 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)". (PAD pg. 3.2.5-19)

Although the Applicants propose to collect further information regarding steelhead spawning gravels, the Applicant 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.

Water Resources (Section 3.2.2):

There is little information in the PAD about water quality between CFW Dam and the diversion dam. Water is diverted at CFW Dam and is subject to thermal loading within the inter-dam reach. There is no discussion in the PAD regarding how Project operations alter residence time or warming in this reach, which has a direct impact on fish populations downstream.

Aquatic Resources (Section 3.2.3):

The PAD does provide adequate information regarding green sturgeon (*Acipenser medirostris*) or white sturgeon (*Acipenser transmontanus*). As fish native to the Bear River Watershed, green and white sturgeon are currently present in the Bear River, Feather River, Yuba River, Sacramento River and in the Sacramento-San Joaquin Delta. As mentioned above, green sturgeon are listed as threatened under the ESA and critical habitat occurs in the Feather River

downstream of the Project. The Project directly affects sturgeon and their habitat in the Bear and Feather Rivers, downstream to the Delta.

The PAD also ignores information provided by NMFS to the licensee documenting current presence of sturgeon in the Bear River, and does not provide any information on sturgeon in the Bear or Feather Rivers. The PAD does not list sturgeon as "potentially" occurring in the watershed, as it does with other species listed in table 3.2.3-8.

On June 11, 2015 NMFS staff sent an e-mail to HDR (consultants for SSWD) documenting California Department of Fish and Game report of sturgeon in the lower Bear River, this information was not included in the PAD.

In addition, information provided by California Department of Fish and Wildlife (CDFW) documents both green and white sturgeon occurrence in the Bear River (Beamesderfer, Kopp, and Demko 2004; USFWS 1995; Beamesderfer et al. 2005). More recently, CDFW staff have documented sturgeon presence in the lower Bear River using DIDSON camera technology and recreational fisherman have anecdotally reported capture of sturgeon in the lower Bear River. None of this information was included in the PAD.

Threatened and Endangered Species (Section 3.2.5):

The PAD should include green sturgeon as a federally protected species under the ESA that occurs in the Bear and Feather Rivers. The PAD should include life-history requirements of green sturgeon, documented occurrences, and the current suitability of the Bear River to support green sturgeon.

Comments on Applicant Proposed Studies

Study 2.1 Water Temperature Monitoring Study:

NMFS recommends the licensee continue to collect water temperature information indefinitely into the next FERC license or until the Licensee and TLP participants agree that a representative set of environmental conditions have been captured, rather than stopping at an arbitrary point in time.

Study 2.2 Water Temperature Modeling Study:

NMFS is generally supportive of modeling reservoir and stream temperatures in the Bear River. The temperature modeling platform that is selected should not only be able to meet the goals and objectives of the Applicant's proposed study but should be able to meet the goals and objectives of NMFS study request #2: Coldwater Delivery Feasibility for Anadromous Fish (see below). The objectives of NMFS requested study should use the existing operations and water temperature models to prioritize coldwater delivery to the lower Bear River using existing infrastructure as well as be able to simulate infrastructure changes including lower intake elevations and alternative water delivery pathways.

Study 3.1 Salmonid Redd Survey:

Section 4.3.1 outlines a gravel mapping procedure to survey possible salmonid spawning sites in the lower Bear River. Generally, NMFS is supportive of mapping coarse substrate in the lower Bear River; however we think that NMFS requested study #1 Fluvial Processes, if implemented according to the study plan, will provide a more complete understanding of the Project's effect on coarse substrate.

In NMFS study request #1 (see below), the areas of suitable spawning gravel would be calculated from the total coarse sediment mapped and the spawning gravel will represent a subset of the coarse sediment storage. However, spawning habitat differs from coarse sediment storage in that these areas need to be hydraulically suitable for spawning, located in the wetted channel during the spawning season, and the size range of suitable spawning gravels is likely narrower. In many instances the two metrics will overlap and represent minimal additional field effort to collect both parameters. Both metrics are necessary to quantify because spawning habitat reflects the current area available for fish spawning utilization while coarse sediment storage reflects the volume of sediment available for geomorphic processes to function properly. Both metrics are a direct result of Project impacts on the balance of sediment supply and transport capacity.

Section 4.3.2 Step 2, outlines procedures for conducting redd surveys. NMFS believes this information would be more appropriate in the "Study 3-2 Stream Fish Populations Study" in a section that synthesizes all information regarding anadromous fish presence in the lower Bear River.

The Applicant should also conduct redd surveys by boat at least every two weeks during the spawning season so that no potential redds are missed. Conducting redd surveys every two weeks or more frequently is standard practice, e.g. Pacific States Marine Fisheries Commission redd monitoring on the Yuba River as outlined in Sterman and Massa (2015). Furthermore, redd surveys should measure physical characteristics, including dimensions and total area of each redd, to aid in species identification and population estimates.

Study 3.2 Stream Fish Populations:

This study should synthesize all information regarding historic and current populations of anadromous fish in the Bear River, including sturgeon.

As currently proposed, this study will not provide adequate information to characterize the Project's effect on anadromous fish including fall and late fall-run Chinook salmon, green sturgeon, and Central Valley steelhead. The frequency of snorkeling observations should be increased to once per month from October through June below the diversion dam in order to capture fish that are expected to occur during these months. If turbidity prevents the licensee from making visual observations by snorkeling, then they should conduct beach seining in conjunction with visual observations. The licensee should also deploy DIDSON or ARIS underwater video camera systems. Exact location and timing of camera deployment would be developed in conjunction with TLP participants. Deployment of DIDSON or ARIS underwater

video cameras would be especially helpful to document sturgeon in deep pools not visible to snorkelers or accessible to seining.

The Licensee should also collect environmental DNA (eDNA) during this study to assist in determining the occurrence of fish species in the lower Bear River. The exact methods would be collaboratively determined with TLP participants including the locations, timing, and methodology for eDNA sampling.

References

Beamesderfer, R., Simpson, M., Kopp, G., Inman, J., Fuller, A., and D. Demko. 2004. Historical and current information on green sturgeon occurrence in the Sacramento and San Joaquin Rivers and tributaries. Prepared for State Water Contractors, Sacramento, CA by S.P. Cramer and Associates, Oakdale, CA.

Beamesderfer, R.C.P., Kopp, G., and D. Demko. 2005. Review of the distribution, life History and population dynamics of green sturgeon with reference to California's central valley. S.P. Cramer and Associates, Gresham, OR and Oakdale, CA.

National Marine Fisheries Service (NMFS). 2014. Recovery plan for the evolutionarily significant units of Sacramento River winter-run Chinook salmon and central valley spring-run Chinook salmon and the distinct population segment of California central valley steelhead. California Central Valley Area Office. July 2014.

Sterman and Massa, 2015. Redd Monitoring and Mapping in the Englebright Dam Reach of the Lower Yuba River, CA. Pacific States Marine Fisheries Commission, prepared for the U.S. Army Corps of Engineers.

United States Fish and Wildlife Service (USFWS). 1995. Working paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the central valley of California, Vol. 2. Stockton, CA.

Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, and P.B. Moyle. 2001. Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California *in* Contributions to the Biology of Central Valley Salmonids. Vol. 1. California Department of Fish and Game, Fish Bulletin 179, R.L. Brown, ed.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

South Sutter Water Districts	**)**	
Camp Far West Hydroelectric Project	**)**	**Project No. 2997**
Bear River	**)**	

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document, by first class mail or electronic mail, a letter to Secretary Bose, Federal Energy Regulatory Commission, the National Marine Fisheries Service's comments on the preferred use of the ILP and this Certificate of Service upon each person designated on the official service list compiled by the Commission in the above-captioned proceeding.

Dated this 25th day of August 2016

Thomas Holley
650 Capitol Mall Suite 5-100
Sacramento, CA 95814
(916) 930-5592

APPENDIX A

NMFS Study Request #1
Effects of the Camp Far West Project and Related Facilities
On Fluvial Processes and Channel Morphology for Anadromous Fish
August 25, 2016

The National Oceanic and Atmospheric Administration's, National Marine Fisheries Service (NMFS) hereby files this request for additional information and study with the Federal Energy Regulatory Commission (Commission or FERC) for South Sutter Water District's (Applicant) Camp Far West Hydroelectric Project (Project), FERC Project No. 2997.

Background:

The purpose of this study is to evaluate the effects of the Camp Far West (CFW) Project on fluvial processes and channel morphology of the Bear River, which includes the amount and size of coarse substrate material that are utilized by anadromous fish during their freshwater life stages. A river's character and morphologic function are strongly influenced by the amount and timing of sediment and water provided to them, and any change to this continuum provokes a change in the river and the associated physical and biological processes it supports (Reid and Dunne 2003). Dams can affect channel morphology by trapping sediment, altering the frequency, timing and magnitude of peak flows, and by intercepting large woody debris (LWD) (Grant et al. 2003). Large woody debris (LWD) plays an important role in streams by shaping channel morphology, storing sediment and organic matter, and providing nutrients and habitat for all life-stages of anadromous fish.

Camp Far West Dam, Reservoir, and associated diversion dam interrupt the downstream continuum of sediment and LWD transport by trapping upstream inputs of sediment and LWD. Project operations alter the timing, magnitude, and duration of peak flows, which are the flows responsible for transporting sediment and LWD as well as shaping channel morphology. Operation and maintenance of the Project therefore has the potential to affect fluvial processes, channel form, and associated anadromous fish habitat. This study seeks to quantify the magnitude of the Project's impacts on sediment and LWD supply and the resultant effects on anadromous fish under NMFS jurisdiction.

Request Element #1: Quantify the frequency and volume of LWD inundated and trapped on annual basis by Camp Far West Reservoir

The Camp Far West Dam and Diversion Dam were built in 1924-25. The Dams' construction inundated miles of riparian habitat, disrupting the sediment supply and delivery to the lower Bear River. The goal of this element is to quantify, in volumetric terms, the riparian habitat that has been inundated and the average annual supply of LWD that continues to be trapped as a result of current project operations.

The first step is to quantify the amount of riparian habitat lost during construction of the original Camp Far West Dam and Diversion Dam. The most appropriate method will likely be extrapolating riparian composition, distributions, and frequency from control reaches with similar geomorphic characteristics as the historic, riparian corridor is now under the reservoirs along the length of the now submerged channels. The miles of riparian habitat lost can then be converted into LWD supply recruitment lost due to current operation of the project. This can be accomplished using regional studies of LWD supply such as those in Ruediger and Ward (1996) and Berg et al. (1998)

The second step is to measure or estimate the LWD that enters Camp Far West Reservoir and is not transported downstream to the lower Bear River. Any LWD that is supplied from the upper watershed to Camp Far West Reservoir is likely lost to downstream reaches where fluvially transported LWD would typically deposit in the lower gradient, less confined reaches and provide key habitat for anadromous fish. Although the PAD mentions that little to no LWD is found in the reservoir, no quantitative analysis is presented. Therefore, the frequency and volume of LWD trapped in Camp Far West Reservoir should be quantified using any aerial photographs as well as annual surveys throughout the licensing period. The annual surveys throughout the licensing period should document the length and diameter of LWD trapped in the reservoir, as this information is unlikely available through historical data. Potential impacts of other land use activities, such as timber harvest, salvage logging, and road construction and upstream Dam construction that can alter LWD supply should also be assessed.

Request Element #2: Quantify Coarse Sediment Storage and Available Spawning Habitat in the Lower Bear River

The PAD indicates that SSWD has conducted habitat surveys of 6.5 miles of the 17 miles of the lower Bear River downstream of the Camp Far West Diversion Dam. The PAD does not indicate how the reaches were chosen, what methods were used, or what data was collected. It is likely that some or all of the necessary information has been collected already but was not included in the PAD. For instance, the PAD presents quantitative information such as 11 LWD pieces per mile were found in the lower Bear River (pg.3.2.1-25), but provides no information on what criteria were used to define LWD or how the surveys were conducted.

Therefore, NMFS requests that the licensee conduct habitat mapping and characterization along the remaining length of the lower Bear River downstream of CFW Diversion Dam, starting with the reaches directly below the diversion dam downstream to the Pleasant Grove Rd. crossing and continuing as needed downstream. During the habitat surveys, qualitative information will be collected on sediment and LWD volume according to the methods presented below:

Channel sediment storage should be mapped in the field using methods similar to Kelsey et al. (1987) and Curtis et al. (2005). Stored sediment should be defined as the fraction of the coarse bed material > 8 mm that is mobile during frequent flood events (e.g., 1.5–5-year recurrence interval floods), which typically produces an upper size class boundary in the range of 128 to 180 mm.

Boundaries of each sediment storage patch should be mapped in the field on color aerial photo tiles printed at a relatively high resolution (e.g., less than or equal to 1:2,000). Each sediment storage patch should be described in geomorphic terms, assigned an activity class (e.g., active or semiactive) based on relative position and indicators of residence time, and characterized with a textural facies and an estimated D_{50} and D_{84} grain size. Depth of each patch should be measured with a probing rod (see Hilton and Lisle 1993 for an example) or estimated relative to the depth to bedrock controls or the thalweg elevation if the patch is inaccessible by wading. Gravel permeability should be measured at each gravel patch using a standpipe or similar method to determine fine sediment infiltration.

Additional geomorphic parameters in each sample site that need to be quantified include: bankfull width, wetted channel width, water surface slope, and reach length. Sediment storage areas mapped in the field on air photo tiles should be digitized in GIS, and the area of each patch calculated. Unit storage area (*i.e.*, area of sediment storage per unit area of bankfull channel in m^2/m^2) and unit storage volume (*i.e.*, volume of sediment storage per unit area of bankfull channel in m^3/m^2) should be calculated for each sample reach from field measurements of channel width, reach length, and depth of storage.

Areas of suitable spawning gravel should be calculated from the total coarse sediment mapped; spawning gravel will represent a subset of the coarse sediment storage mapping; however, spawning habitat differs from coarse sediment storage in that these areas need to be hydraulically suitable for spawning, located in the wetted channel during the spawning season, and the size range of suitable spawning gravels is likely narrower. In many instances the two metrics will overlap and represent minimal additional field effort to collect both parameters. Both metrics are necessary to quantify because spawning habitat reflects the current area available for fish spawning utilization while coarse sediment storage reflects the volume of sediment available for geomorphic processes to function properly. Both metrics are a direct result of Project impacts on the balance of sediment supply and transport capacity.

Request Element #3: Quantify LWD presence in the Lower Bear River

During the habitat surveys, the current frequency and volume of LWD stored in the lower Bear River should be quantified. Where possible the existing LWD loading data should be compared with any available historical data to assess how the resource amount is trending through time.

Listed below are generally accepted guidelines for inventorying LWD that are used throughout CA and the Pacific Northwest in FERC and non-FERC projects; following these guidelines facilitates data comparison with other data sets that would be useful for regional comparisons. LWD greater than 1 m long within the active channel will be recorded and binned within four diameter classes: small (10-30 cm [4–12 inches]), medium (31-60 cm [12–24 inches]), large (61-90 cm [24–36 inches]), and very large (>90 cm [>36 inches]); and four length classes (1.0–7.3 m [3-25 ft], 7.3–14.6 m [25–50 ft], 14.6–21.9 m [50–75 ft], and >21.9 m [75 ft]). More detailed measurements should be taken for key pieces, which are defined as pieces either longer than 1/2 times the bankfull width, or of sufficient size and/or are deposited in a manner that alters channel

morphology and aquatic habitat (e.g., trapping sediment or altering flow patterns). Key piece characteristics to be recorded will include:

a. piece location, either mapped onto aerial photos or documented with GPS
b. piece length
c. piece diameter
d. piece orientation
e. position relative to the channel
f. whether the piece has a rootwad
g. tree species or type (e.g., conifer or hardwood)
h. whether the piece is associated with a jam or not
i. the number of large pieces in the jam
j. recruitment mechanism
k. function in the channel

TLP Study Requirements 18 CFR § 16.8(b)(5)(i-vi):

This request for information or study is formatted in accordance with the Federal Power Act regulations that govern the Traditional Licensing Process [§16.8(b)(5)(i-vi)].

(i) Identifying its determination of necessary studies to be performed or information to be provided by the potential applicant;

See "Elements #1- #3" above.

(ii) Identifying the basis for its determination;

See "Background" section above.

(iii) Discussing its understanding of the resource issues and its goals objectives for these resources;

Dams such as CFW can affect channel morphology by trapping sediment, altering the frequency, timing and magnitude of peak flows, and by intercepting LWD (Grant et al. 2003). A river's character and morphologic function are strongly influenced by the amount and timing of sediment and water provided to them, and any change to this continuum provokes a change in the river and the associated physical and biological processes it supports (Reid and Dunne 2003). The Project facilities trap sediment and LWD inputs from the watershed and remove them from lower Bear River ecosystem, and in addition the Project alters the flow regime and hydrograph variability that drives geomorphic processes.

This study has two primary goals: (1) to assess the potential geomorphic effect of reducing sediment and LWD supply to, and altering sediment transport capacity within, the lower Bear River, and (2) to provide information required to assess potential anadromous fish habitat impacts of any changes to geomorphic processes in the lower Bear River resulting from Project facilities or operations.

Study goals will be met by completing the following specific objectives:

1. Quantify miles of riparian habitat inundated by CFW reservoir
2. Quantify LWD frequency and volume trapped on an annual basis by CFW Reservoir.
3. Conduct Habitat characterization surveys of the lower Bear River
4. Survey the volume of mobile, coarse sediment stored in the active channel
5. Quantify amount and quality of available salmonid spawning habitat
6. Survey the frequency and volume of LWD stored in the bankfull channel

If this information is developed it will help the Commission and NMFS identify and implement measures to protect, mitigate or minimize direct, indirect, and cumulative impacts to, and enhance native anadromous fish resources, including related rearing and feeding, migration, spawning, riparian and benthic macro invertebrate habitats, protection from adverse fish hatchery operations and predation, and ensure coordination within and outside of the Project to minimize risk to anadromous fishes.

NMFS' Resource Management Goal and Objectives apply with respect to species listed under the and Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. §1801 *et seq*.) and the Endangered Species Act (ESA) (16 U.S.C. §1531 *et seq*.), as well as anadromous species that are not currently listed but are affected by continuing operations of the Project or may require listing in the future. Thus, our requests for information or study are linked with NMFS' Resource Management Goals and Objectives

(iv) Explaining why each study methodology recommended by it is more appropriate than any other available methodology alternatives, including those identified by the potential applicant pursuant to paragraph (b)(2)(vi) of this section;

The applicant did not identify study methodology in the PAD. Although the PAD indicated that SSWD had done habitat surveys, including identifying LWD, it does not include any study methodology including how habitat sites were selected, how they were surveyed, or how LWD was classified or surveyed. The Instream flow study proposed by SSWD contains a plan to collect LWD using similar guidelines. However, the instream flow study only surveys two study sites, which is insufficient to characterize the entire lower Bear River. The operation of the CFW project affects the entire Bear River, and has done so since its construction in 1925. A complete study of the lower Bear River is needed to accurately quantify the Project's past and current effect on sediment and LWD and anadromous fish.

(v) Documenting that the use of each study methodology recommended by it is a generally accepted practice; and

NMFS has set forth in each element request above specific methodologies consistent with generally accepted practices in the relevant scientific community such as Kelsey et al. (1987), Curtis et al. (2005), Ruediger and Ward (1996) and Berg et al. (1998). This study is also consistent with the goals, objectives, and methods applied in recent FERC hydroelectric relicensing studies in California (e.g. McCloud-Pit Project FERC No. 2106 and South Feather

Power Project FERC No. 2088 [SFWPA 2007] where sediment budget frameworks were used to assess Project effects to geomorphic processes by analyzing the mass balance between sediment supply and transport), and uses well recognized scientific methodologies (e.g., Reid and Dunne 2003; Grant et al. 2003; Hilton and Lisle 1993) and protocols from the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and California Department of Fish and Game.

(vi) Explaining how the studies and information requested will be useful to the agency, Indian tribe, or member of the public in furthering its resource goals and objectives.

If NMFS' request is included in the District's Study Plan and approved in the Commission's Study Plan Determination, then successfully implemented, the results would inform:

1. Whether and how NMFS may exercise its FPA Section 18 authority, to either prescribe fishways at the Project or to reserve its prescriptive authority;

2. NMFS' decisions regarding its future FPA Section 10(j) and 10(a) proposals for protection, mitigation, and enhancement measures;

3. NMFS' decisions regarding its future recommended measures to improve EFH for Chinook salmon in the lower Bear River, as well as areas downstream to the Bay/Delta;

4. The ESA Section 7 consultations (informal and formal) regarding effects on threatened species and designated critical habitats in the Bear River.

This study specifically looks to quantify how resource inputs (sediment and LWD) are removed from the system by entrapment at CFW Reservoir, and how this reduced supply translates into available habitat in the lower Bear River (e.g., spawning gravel, instream wood, and sediment storage). This information will be used by NMFS and other TLP participants to evaluate Project impacts to anadromous fish and their habitats, and inform PM&E measures that could include gravel augmentation, LWD enhancement projects, and prescribing flow regimes designed to promote properly functioning geomorphic and channel processes.

The information or study resulting from this Request would inform future ESA consultation between NMFS and the Commission because the Project and related facilities and operations could affect ESA-listed fishes, and/or their ESA-designated critical habitats, in the Bear River and in locations downstream.

NMFS has identified the following ESA-protected anadromous fish and habitats in the Bear River that could be affected by the Project and related facilities and operations:

1) Anadromous fish and habitat resources protected under the Endangered Species Act (ESA):
    a. Central Valley (CV) spring-run Chinook salmon evolutionarily significant unit (ESU) (*Oncorhynchus tshawytscha*), threatened (June 28, 2005, 70 FR 37160); occupied habitat in:

i. The lower Bear River downstream of Camp Far West Dam;
ii. Dry Creek from the confluence of the Bear River and Dry Creek upstream to the terminus of anadromous fish passage;
iii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
iv. Areas downstream from the Bear and Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

b. CV spring-run Chinook salmon critical habitat (September 2, 2005, 70 FR 52488); currently designated in:
   i. The lower Bear River approximately 5 miles upstream from the confluence with the feather River
   ii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
   iii. Areas downstream from the Bear and Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

c. CV steelhead distinct population segment (DPS) (*O. mykiss*), threatened (January 5, 2006, 71 FR 834); occupied habitat in:
   i. The lower Bear River downstream of Camp Far West Dam;
   ii. Dry Creek from the confluence of the Bear River and Dry Creek upstream to the terminus of anadromous fish passage;
   iii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
   iv. Areas downstream from the Bear and Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

d. CV steelhead critical habitat (September 2, 2005, 70 FR 52488); currently designated in:
   i. The lower Bear River downstream of the Project;
   ii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
   iii. Areas downstream from the Bear and
   iv. Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

e. Southern DPS of North American green sturgeon (*Acipenser medirostris*), threatened (April 7, 2006, 71 FR 17757);
   i. The lower Feather River, and in areas downstream in the Sacramento River and Sacramento-San Joaquin Delta

f. Southern DPS of North American green sturgeon designated critical habitat (October 9, 2009, 74 FR 52300);
   i. The Feather River and Sacramento River downstream from the Yuba River.

2) Anadromous fish habitat resources protected under the Magnuson-Stevens Fishery Conservation and Management Act (MSA):
    a. Chinook salmon "Essential Fish Habitat" (EFH), (October 15, 2008 73 FR 60987); EFH has been identified in the Bear River extending upstream to approximately Camp Far West Dam and in areas downstream in the Feather and Sacramento Rivers, and the Sacramento-San Joaquin Delta.

3) Anadromous fish Federal Species of Concern (those species about which NMFS has concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA):
    a. CV fall/late fall-run Chinook salmon ESU, Species of Concern (April 15, 2004, 69 FR 19975; October 17, 2006, 71 FR 61022); occupied habitat in the lower Bear River downstream of Camp Far West Dam, the lower Bear River, Dry Creek, and in areas downstream in the Feather and Sacramento Rivers, and the Sacramento-San Joaquin Delta.

ESA resources that occur downstream in the Sacramento-San Joaquin Delta, and San Francisco Bay could also be affected by the Project and related facilities and operations.

Please note NMFS is requesting information or study of the effects of the Project and related facilities and operations. While the Commission does not consider some of these facilities or operations to be part of the licensed Project, for ESA purposes, the action, action area, and the effects of an action are defined broadly, and are not restricted to the "Project facilities" or "Project area", and must include the direct, indirect, and cumulative effects of the action. Including related structures such as CFW diversion dam in analysis of the Project's effects will streamline ESA Sec. 7 consultation and avoid delays.

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APPENDIX B

NMFS Study Request #2
Effects of the Camp Far West Project and Related Facilities
On Coldwater Delivery Feasibility for Anadromous Fish
August 25, 2016

The National Oceanic and Atmospheric Administration's, National Marine Fisheries Service (NMFS) hereby files this request for additional information and study with the Federal Energy Regulatory Commission (Commission or FERC) for South Sutter Water District's (Applicant or District) Camp Far West Hydroelectric Project (Project), FERC Project No. 2997.

Background:

The purpose of this study request is to evaluate the effects of the Camp Far West (CFW) Project and associated facilities on water temperature and evaluate whether the Project can reliably deliver cold water to benefit salmonids in the lower Bear River. The lower Bear River downstream of CFW diversion dam does not currently provide suitable habitat for self-sustaining populations of anadromous salmonids, including Central Valley (CV) steelhead. Any CV steelhead that intermittently spawn in the Bear River during high flow years are likely strays from the Feather River Fish Hatchery. This is likely because water temperatures during the summer preclude year-round juvenile rearing in the lower Bear River (NMFS 2014).

The Project is currently operated to fill CFW reservoir during winter rains for irrigation deliveries during summer months. The construction and operation of the Project has inundated miles of the riverine environment of the Bear River. The Bear River upstream of CFW Dam is now CFW reservoir — a lentic environment with large changes in water quality— including water temperature. This study request examines how the reservoir has altered water temperature and how the District makes releases from reservoir storage with concern for improving habitat for salmonids during the summer months in the lower Bear River.

Controlled releases from CFW Reservoir are made from one of two intake structures associated with the Camp Far West Dam: the power intake that was constructed when hydropower was added to the dam, and the intake structure for the outlet works. Both structures are submerged for most of the year and are located at the upstream toe of the main dam. The power intake structure is at an elevation is at 197.0 ft. and the intake for the outlet it at an elevation is at 175.0 ft. (PAD p.2.3).

Because of the generating unit's operating characteristics, power can only be generated when the elevation of the reservoir water surface is at or above 236 ft. and when reservoir outflow is greater than 130 cfs. If these two criteria cannot be met, water is released through the low-level outlet. This condition normally occurs each year starting in September and continuing into the

fall until such time as surplus inflows are available to be passed through the powerhouse. (PAD pg. 2.7)

Little information is provided in the PAD regarding the 38 ft. tall diversion dam located 1.25 miles downstream from CFW Dam or the pool created by the diversion dam. Although the diversion dam is not part of the FERC project, it is closely related to the project and enables releases to the lower Bear River to meet FERC license requirements and irrigation delivery into South Sutter Water District's and Camp Far West Irrigation District's canals.

Operation of all of the structures and outlet works of CFW Dam and diversion dam effect the water quality of the lower Bear River below the diversion dam. This study seeks to illuminate how water temperature in the lower Bear River is affected by these decisions and if colder water could be delivered by changing operating decisions, altering infrastructure or a combination of both.

Request Element #1: Develop Operational Scenarios to prioritize coldwater delivery to the lower Bear River

The focus of this study is water temperature April-October in the lower Bear River below CFW diversion dam. The goal is to see if the Project can be operated to reliably deliver cold water to support juvenile salmonid rearing the lower Bear River during these months, and what costs would result from operating in this manner.

The licensee should use the existing operations and water temperature models to prioritize coldwater delivery to the lower Bear River using existing infrastructure. Operational decisions (e.g. releasing water via the powerhouse intake or outlet intake) would be made to optimize coldwater delivery to the lower Bear River. Initially the target would be to release water below CFW diversion dam that is <14˚C as a daily average temperature in the months April-October. If that target cannot be met, then subsequent runs targeting <16˚C and <18˚C should be made. If those targets cannot be met, then the months and years in which the targets could not be met should be reported along with how much the water warmed in the diversion pool under different release scenarios.

This operational scenario would seek to maximize coldwater delivery by prioritizing delivery from the outlet works vs. power intake when appropriate; as well as preserving the coldwater pool early in spring and fall when meteorological conditions are cooler. This scenario will quantify lost electricity generation and other costs associated with operating in this manner.

Request Element #2: Develop Conceptual Engineering Options for Modifications to Infrastructure Needed to Deliver Cold Water

This element will study the feasibility of conceptual engineering options for modifications to one or both of the Project's existing water intakes at CFW Dam. One of the options shall include modifying one or both of the existing intakes with a new wet well and adjustable weir gates. The

gates would allow selective water withdrawal from various depths at elevations relating to thermally suitability for salmonid rearing. The ability to manipulate cold water release with the gates would facilitate reliable cold water delivery to support juvenile salmonid rearing in the lower Bear River. In addition to the water intake tower modification, options for water conveyance of cold water below the diversion dam should be developed and could consist of piped or open systems. All conceptual engineering alternatives should be developed in consultation with interested TLP participants and should include class 5 opinion of probable construction cost (OPCC) estimates of the conceptual facilities at time of construction.

Using results from temperature profiles of CFW reservoir and Diversion pool, conceptual engineering alternatives should be developed that will maximize coldwater delivery to the lower Bear River.

Request Element #3: Simulate Infrastructure and Operational Changes on Water Temperature in the lower Bear River

Using the most promising conceptual alternatives developed in element #2, update the temperature and operations models to simulate operations of these structures in ways that prioritizes cold water delivery to the lower Bear River. The same scenarios that were run in Element #1 of this study request should be run again, but this time with additions to the model that simulate use of new structures identified in element #2 that could reliably deliver cold water to the lower Bear River. The new most promising conceptual alternatives should be selected in consultation with the licensing participants and represent the most effective and reliable alternatives for delivering cold water below SSWD irrigation dam.

TLP Study Requirements 18 CFR § 16.8(b)(5)(i-vi):

This request for information or study is formatted in accordance with the Federal Power Act regulations that govern the Traditional Licensing Process [§16.8(b)(5)(i-vi)].

(i) Identifying its determination of necessary studies to be performed or information to be provided by the potential applicant;

See “Request Elements 1-3” above.

(ii) Identifying the basis for its determination;

See “Background” section above.

(iii) Discussing its understanding of the resource issues and its goals and objectives for these resources;

The goal of this study is to understand the Project’s effects on water temperature and the species under NMFS jurisdiction and to understand what operations and infrastructure changes can be implemented to improve habitat and survival of the species under NMFS jurisdiction.

NMFS' Resource Management Goal and Objectives apply with respect to species listed under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. §1801 *et seq*.) and the Endangered Species Act (ESA) (16 U.S.C. §1531 *et seq*.), as well as anadromous species that are not currently listed but are affected by continuing operations of the Project or may require listing in the future. Thus, our request for information or study are linked with NMFS' Resource Management Goals and Objectives

(iv) Explaining why each study methodology recommended by it is more appropriate than any other available methodology alternatives, including those identified by the potential applicant pursuant to paragraph (b)(2)(vi) of this section;

The Applicant did not identify a study to investigate the feasibility of delivering cold water to the lower Bear River. The Applicant has identified water temperature monitoring and modeling studies as well as operations modeling studies. NMFS is generally supportive of these studies and has also provided specific comments in regards to these Applicant proposed studies. Providing that the studies are implemented as outlined in the study plan along with NMFS comments, those studies should be utilized as a part of completion of NMFS requested study.

(v) Documenting that the use of each study methodology recommended by it is a generally accepted practice; and

NMFS has set forth in each element request above specific methodologies consistent with generally accepted practices in the relevant scientific community. This study is consistent with the goals, objectives, and methods applied in Bureau of Reclamation sponsored studies on a water temperature control device in Shasta Reservoir (e.g. Hanna et al. 1999) and Sonoma County Water Agency's studies on a coldwater delivery pipeline to dry Creek (e.g. SCWA 2011).

(vi) Explaining how the studies and information requested will be useful to the agency, Indian tribe, or member of the public in furthering its resource goals and objectives.

If NMFS' request is included in the District's Study Plan and approved in the Commission's Study Plan Determination, then successfully implemented, the results would inform:

5. Whether and how NMFS may exercise its FPA Section 18 authority, to either prescribe fishways at the Project or to reserve its prescriptive authority;

6. NMFS' decisions regarding its future FPA Section 10(j) and 10(a) proposals for protection, mitigation, and enhancement measures;

7. NMFS' decisions regarding its future recommended measures to improve EFH for Chinook salmon in the lower Bear River, as well as areas downstream to the Bay/Delta;

8. The ESA Section 7 consultations (informal and formal) regarding effects on threatened species and designated critical habitats in the Bear River.

This study, if implemented as outlined above, will quantify how CFW Reservoir affects water temperature, and how this translates into thermally suitable habitat in the lower Bear River. This information will be used by NMFS and other TLP participants to evaluate the Project's impacts to aquatic species and the habitat that supports them. The results of this study will inform PM&E measures that could include changing operational decisions and/or infrastructure improvements to improve water quality in the lower Bear River.

The information or study resulting from this Request would inform future ESA consultation between NMFS and the Commission because the Project and related facilities and operations could affect ESA-listed fishes, and/or their ESA-designated critical habitats, in the Bear River and in locations downstream.

NMFS has identified the following ESA-protected anadromous fish and habitats in the Bear River that could be affected by the Project and related facilities and operations:

4) Anadromous fish and habitat resources protected under the Endangered Species Act (ESA):
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        i. The lower Bear River downstream of Camp Far West Dam;
        ii. Dry Creek from the confluence of the Bear River and Dry Creek upstream to the terminus of anadromous fish passage;
        iii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
        iv. Areas downstream from the Bear and Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

    b. CV spring-run Chinook salmon critical habitat (September 2, 2005, 70 FR 52488); currently designated in:
        i. The lower Bear River approximately 5 miles upstream from the confluence with the feather River
        ii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
        iii. Areas downstream from the Bear and Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

    c. CV steelhead distinct population segment (DPS) (*O. mykiss*), threatened (January 5, 2006, 71 FR 834); occupied habitat in:
        i. The lower Bear River downstream of Camp Far West Dam;
        ii. Dry Creek from the confluence of the Bear River and Dry Creek upstream to the terminus of anadromous fish passage;
        iii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;

iv. Areas downstream from the Bear and Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

d. CV steelhead critical habitat (September 2, 2005, 70 FR 52488); currently designated in:
   i. The lower Bear River downstream of the Project;
   ii. The lower Feather River downstream of the confluence of the Bear and Feather Rivers;
   iii. Areas downstream from the Bear and
   iv. Feather Rivers, in the Sacramento River and Sacramento-San Joaquin Delta.

e. Southern DPS of North American green sturgeon (*Acipenser medirostris*), threatened (April 7, 2006, 71 FR 17757);
   i. The lower Feather River, and in areas downstream in the Sacramento River and Sacramento-San Joaquin Delta

f. Southern DPS of North American green sturgeon designated critical habitat (October 9, 2009, 74 FR 52300);
   i. The Feather River and Sacramento River downstream from the Yuba River.

5) Anadromous fish habitat resources protected under the Magnuson-Stevens Fishery Conservation and Management Act (MSA):
   a. Chinook salmon "Essential Fish Habitat" (EFH), (October 15, 2008 73 FR 60987); EFH has been identified in the Bear River extending upstream to approximately Camp Far West Dam and in areas downstream in the Feather and Sacramento Rivers, and the Sacramento-San Joaquin Delta.

6) Anadromous fish Federal Species of Concern (those species about which NMFS has concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA):
   a. CV fall/late fall-run Chinook salmon ESU, Species of Concern (April 15, 2004, 69 FR 19975; October 17, 2006, 71 FR 61022); occupied habitat in the lower Bear River downstream of Camp Far West Dam, the lower Bear River, Dry Creek, and in areas downstream in the Feather and Sacramento Rivers, and the Sacramento-San Joaquin Delta.

ESA resources that occur downstream in the Sacramento-San Joaquin Delta, and San Francisco Bay could also be affected by the Project and related facilities and operations.

Please note NMFS is requesting information or study of the effects of the Project and related facilities and operations. While the Commission does not consider some of these facilities or operations to be part of the licensed Project, for ESA purposes, the action, action area, and the effects of an action are defined broadly, and are not restricted to the "Project facilities" or

"Project area", and must include the direct, indirect, and cumulative effects of the action. Including related structures such as CFW diversion dam in analysis of the Project's effects will streamline ESA Sec. 7 consultation and avoid delays.

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