



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Region 1 – Northern
601 Locust Street
Redding, CA 96001
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



January 29, 2016

Parker Thaler
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

**Subject: Notice of Preparation for an Environmental Impact Report
for the Klamath Hydroelectric Project Relicensing
State Clearinghouse Number 2015122002**

Dear Mr. Thaler:

The California Department of Fish and Wildlife (Department) has reviewed the Notice of Preparation (NOP) of an environmental impact report (EIR) for the Klamath Hydroelectric Project Relicensing (Project), which would involve modifications and the continued operation of the hydroelectric facilities (State Clearinghouse Number 2015122002). The Department appreciates this opportunity to comment on the above-referenced Project relative to impacts to biological resources.

The Department must begin this comment letter, however, acknowledging certain developments. In February 2010, the Governor of California and the Department signed the Klamath Hydroelectric Settlement Agreement (KHSA) and the Klamath Basin Restoration Agreement (KBRA). The KHSA lays out a process for removal of four PacifiCorp dams (J.C. Boyle, Copco 1, Copco 2, and Iron Gate) on the Klamath River to serve the public's interest and restore depressed fisheries in the Klamath River watershed. The KHSA and two related agreements – the Klamath Basin Restoration Agreement (KBRA) and the Upper Klamath Basin Comprehensive Agreement (UKBCA) – were developed to resolve long-standing resources challenges in the basin comprehensively and collaboratively.

The Department is a signatory to the KHSA and remains committed to working with those parties to maintain the benefits of that agreement. The Department also remains committed to achieving a comprehensive and collaborative resolution with Tribes, the power company, conservation groups, commercial fishing interests, and agricultural and water user communities.

The Department provides comments in this letter because the Board's process requires us to do so. However, the comments that the Department provides in this letter should be viewed against our preference for continued resolution of problems through collaboration. In the event that the relicensing proceeding for this Project continues, and given that the Board requests comments under that scenario pursuant to the NOP, the Department submits comments responsive to that scenario.

The Department offers the following comments and recommendations on the Project in our role as the State's trustee for fish and wildlife resources and as a Responsible Agency under the California Environmental Quality Act (CEQA), California Public Resources Code section 21000 et seq. Pursuant to Fish and Game Code (FGC) section 1802, the Department has jurisdiction over the conservation, protection, and management of California's fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of those species.

The Department's primary concerns involving the Project include impacts to salmonids due to: (1) inadequate fish passage up and downstream, (2) inadequate flow regimes, and (3) degraded water quality conditions.

The Department has been actively participating in the relicensing process for the Project since December 2000 when we received PacifiCorp's "*First Stage Consultation Document*" and we continue to participate to date. The Department filed a Federal Power Act (FPA) section 10(j) (16 U.S.C. § 803(j)) on March 27, 2006.¹

The Department was also the CEQA Lead Agency for Klamath Facilities Removal Environmental Impact Statement/ Environmental Impact Report (Klamath EIS/EIR) that analyzed the potential impacts to the environment from removing the four PacifiCorp dams as contemplated in the KHSA. Finally, the Department is responsible for the management and operation of the Iron Gate Hatchery, which provides mitigation for the Project located just below Iron Gate Dam. The production goals that drive Iron Gate Hatchery operations are only intended to mitigate for the loss of habitat between Iron Gate Dam and Copco 2 dam (FERC, 1963).

Authority

The following policies and State statutes regarding water, fish, and terrestrial resources guide the Department's authorities and should be considered in the EIR.

- The California Fish and Game Commission's policy on water provides: "*The quantity and quality of the waters of the state should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife.*"
- The California Endangered Species Act (CESA), FGC section 2080 et seq., establishes the policy of the State to conserve and restore any threatened or endangered species and their habitat. Coho salmon were listed as threatened pursuant to CESA in 2006. PacifiCorp does not currently have State coverage for the

¹Section 10(j) of the FPA requires the Commission to include in any license fish and wildlife measures for the protection, mitigation of damages to, and enhancement of fish and wildlife resources potentially affected by the Project based on recommendations from the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and state fish and wildlife agencies.

take of State-threatened coho salmon due to their operations from the State of California. CESA sections 2080.1 and 2081 describe the processes for an entity to receive take coverage under CESA.

- FGC section 5515 states that fully protected fish may not be taken or possessed at any time. Shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Catostomus luxatus*) are fully protected fish species that occur in the Klamath River watershed and are impacted by the Project.
- FGC section 5901 states that it is unlawful to construct or maintain in any stream any device or contrivance that prevents, impedes, or tends to prevent or impede, the passing of fish up and down stream.
- FGC section 5931 requires the owner of a dam to furnish a suitable fishway in consultation with the Department where the Fish and Game Commission determines that the dam does not allow free passage for fish.
- FGC section 5937 reads, in part: *"The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam."* FGC section 45 defines "fish" as *"wild fish, mollusks, crustaceans, invertebrates, or amphibians, including any part, spawn or ova thereof."*
- FGC section 5980 et seq. requires installation of screens approved by the Department on all conduits to hydropower facilities if, in the opinion of the Department, such a screen is necessary to prevent fish from passing into the conduit. This section specifically notes that conduits to power devices *"tend to destroy fish in a greater degree"* than other conduits.
- The Salmon, Steelhead Trout, and Anadromous Fisheries Program Act (Act) (FGC § 6900 et seq.) requires the Department to undertake major efforts to restore the State's salmon, steelhead trout, and anadromous fisheries. Specifically, the Act directs the Department to develop a plan and program to double the current natural production of salmon and steelhead trout resources in the State (FGC § 6902, subd. (a)), and to consult with public agencies whose policies or decisions affect the goals of such a program to determine if there are feasible means for those public agencies to assist the Department in achieving the goals of the program (FGC § 6920, subd. (b)). The waters and lands impacted by the Project represent major components in the Department's efforts to maintain and restore anadromous fish populations in accordance with the Act.

- The Act also provides: *“Reliance on hatchery production of salmon and steelhead trout in California is at or near the maximum percentage that it should occupy in the mix of natural and artificial hatchery production in the State. Hatchery production may be an appropriate means of protecting and increasing salmon and steelhead in specific situations; however, when both are feasible alternatives, preference shall be given to natural production.”* (FGC § 6901, subd. (f))

Project Description and Scoping

The NOP provides the project title as “Klamath Hydroelectric Project Relicensing,” along with a description of project location, objectives and existing facilities, but does not provide a detailed description of the Project the State Water Resources Control Board (State Board) is proposing to analyze in the EIR. The NOP states the EIR will evaluate potential impacts of proposed modifications and continued operation of the Project to water quality and other resources within California as compared to the environmental baseline. Since the Federal Energy Regulatory Commission (FERC) chose and analyzed the Staff Alternative, it is one potential alternative that could be analyzed as the CEQA project. Regardless of which alternative is the CEQA project, the Department recommends the EIR provide a clearly defined project description from which to analyze impacts.

To enable the Department to adequately review and comment on the EIR, we recommend the following scoping information be included:

1. A complete assessment of the flora and fauna within and adjacent to the Project area should be conducted, with particular emphasis upon identifying special-status species that may be impacted by the project including fully-protected, rare, threatened, and endangered species. This assessment should also address locally unique species, rare natural communities, and wetlands. The assessment area for the Project should be large enough to encompass areas potentially subject to both direct and indirect Project effects. Both the Project footprint and the assessment area (if different) should be clearly defined and mapped in the EIR.
2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources with specific measures to offset such impacts should be included.
3. Mitigation measures for adverse Project-related impacts to sensitive plants, animals, and habitats should be developed and thoroughly discussed. Mitigation measures should first emphasize avoidance and reduction of Project impacts. For unavoidable impacts, compensatory mitigation measures should be identified.

Geographic Scope

The Project's boundary includes approximately 20 miles of the Klamath River within the State starting at the Oregon-California border and continuing downstream to Iron Gate Dam. This stretch of the Klamath River includes a 6-mile riverine reach upstream of Copco reservoir which is designated as a wild trout area and managed under the Department's Wild Trout Program. It also includes three reservoirs, Copco 1 and 2 and Iron Gate, as well as approximately 1.5 miles of Fall Creek, a tributary just upstream of Iron Gate reservoir. Iron Gate Dam serves as the lower limit of the FERC boundary and the upper limit of the anadromous fishery on the mainstem Klamath River. However, the Project affects temperature downstream to the confluence of the Salmon River, about 124 miles downstream of Iron Gate Dam. The FERC Final Environmental Impact Statement (FERC EIS, FERC 2007) concludes that the Project modifies the temperature regime downstream of Iron Gate Dam in a manner that at times adversely affects salmon.

Upstream of the California section, the current Project boundary includes approximately 50 miles of the Klamath River in the State of Oregon. The Oregon section starts at Link River Dam in Klamath Falls and continues down to the Oregon/California border. Although this portion of the Project falls outside of California, ecological processes do not segregate along jurisdictional boundaries. The Project blocks access for anadromous fish to over 400 miles of habitat upstream from Iron Gate Dam, well beyond the Project's upstream most dam. We recommend that an evaluation of Project components in Oregon that affect resources within California be conducted in the EIR.

The Project features and operations affect the Klamath River fish and wildlife resources at a fundamental level. The Project alters basic ecological processes such as fluvial geomorphology and hydrology while fragmenting and degrading aquatic and terrestrial habitats. The anadromous fishery resources of the Klamath River have undergone a major decline during the past century. Estimates from the commercial fishing industry place the current salmon and steelhead populations in the Klamath River at eight percent or less of their historic abundance (Institute of Fisheries Resources 2004). Degradation of habitat and the subsequent decline in fisheries resources has led to the listing of coho salmon under both the federal Endangered Species Act and CESA, as well as curtailment of fisheries along the Pacific Coast from the Columbia River to south of San Francisco to protect Klamath Basin origin Chinook salmon. In 1999, the Pacific Fishery Management Council identified the mainstem Klamath River and its tributaries from its mouth to Iron Gate Dam as essential fish habitat for Chinook and coho salmon.

Many different land and water management activities have contributed to the decline of the Klamath River fishery and habitat. Construction of the Project stands out as one of the most direct and detrimental activities. Completion in 1918 of Copco 1 dam

blocked access to hundreds of miles of anadromous habitat including primary Chinook and steelhead spawning and rearing grounds upstream. Impassable Project facilities also block access to thermal refugia. Completion in 1962 of the lowermost dam (Iron Gate) blocked access to known thermal refugia remaining in tributaries and mainstem springs. Subsequent to this final phase of Project construction, the spring-run Chinook population downstream of the dam underwent serious decline. Today, the mouth of the Salmon River (over 130 miles downstream of Iron Gate Dam) marks the upper limit of a remnant spring-run population in the Klamath River. The lack of fish passage at Project facilities is a direct, unequivocally adverse impact of the Project on the anadromous fish resources of the Klamath Basin.

Analyses indicate Project facilities and operations have shifted the timing of two critical and interrelated phenomena—water temperature and disease transmission. These shifts in temperature and disease risk below Iron Gate Dam occur at vulnerable life stages for out-migrating juveniles and spawning adults. These disruptions of natural cycles exacerbate already challenging conditions for Klamath River resources and compound Project impacts on the downstream fishery.

Water Quality and Instream Flow

In addition to altering Klamath River flow regimes, the Project contributes to the degradation of water quality in the Klamath River. Preliminary water quality modeling results indicate that Project dams such as Keno, J.C. Boyle, Copco No. 1 and Iron Gate impact water quality by slowing and storing water, increasing retention time and solar exposure, and shifting thermal regimes and nutrient cycling. The Project facilities and operations exacerbate already significantly impaired water quality conditions in the Klamath River.

The Project's continual degradation of water quality, specifically high water temperatures, in the Klamath River impacts fishery resources. The extension of high water temperatures into August and September due to Project dams likely postpones spawning migration, delaying spawning and egg development. In addition, elevated water temperatures in August and September increase adult mortality through stress and crowding (Schreck and Li, 1991; Matthews and Berg, 1997).

Cyanobacteria, also known as blue-green algae, are a family of single-celled algae. Cyanobacteria proliferate in water bodies such as ponds, lakes, reservoirs, and slow-moving streams that lack vertical mixing and when the water is warm and nutrients are available. They generally occur in areas of poor water quality. Many cyanobacteria species produce a group of toxins known as microcystins, some of which are toxic. The species most commonly associated with microcystin production is *Microcystis aeruginosa*. Upon ingestion, toxic microcystins are actively absorbed by fish, birds, and mammals. Microcystins primarily affect the liver, causing minor to widespread damage, depending on the amount of toxin absorbed. Microcystins have

been measured in several water bodies in California, including the Klamath River and its reservoirs.

Fish and wildlife mortalities have been linked to microcystin poisoning. Pets and livestock have died after drinking water contaminated with microcystins. In the *“Revised Recovery Plan for the Lost River Sucker and Shortnose Sucker,”* the U.S. Fish and Wildlife Service identifies microcystin as an algal toxin that affects the liver of these species and is one of the factors in the suckers decline (USFWS 2012). A wild roe deer in Norway was necropsied and the cause of death was acute cyanobacterial hepatotoxicosis (Handeland, K. and O. Ostensvik 2010). In 2014, the California Animal Health and Food Safety Laboratory necropsied a black-tailed deer from Siskiyou County and cause of death was microcystins (Shirkey et al. 2015).

Restoration of flows to more natural conditions will help to improve water quality conditions in each reach. Sufficient water should be released from each of the Project facilities and operations in order to:

1. Provide a flow regime of sufficient quantity to allow native aquatic and riparian species to establish and flourish within the Project.
2. Provide a flow regime to support a diverse native coldwater fishery in good condition, and with controlled flow transitions that avoid stranding, stressing, or displacement of native aquatic species.
3. Provide safe, timely and effective up and downstream passage for native fish at Project facilities that meets or exceeds relevant federal and State criteria.
4. Provide water of sufficient quantity and quality within and downstream of the Project to meet or exceed the North Coast Regional Water Quality Control Board Basin Plan (2001) (Plan) water quality objectives including temperature. The temperature objective reads, in part: *“At no time or place shall the temperature of any cold water be increased by more than 5°F above natural receiving water temperature. . .”* (Plan, p. 3-4).
5. Provide water of sufficient quantity and quality within and downstream of the Project to mitigate for Project impacts contributing to the incidence of fish disease in the mainstem Klamath River.
6. Establish a geomorphically functional stream channel above and below Project diversions.

The Project facilities and operations exacerbate already significantly impaired water quality conditions in the Klamath River. Even with fish passage, the project affects aquatic and

riparian habitat due to modified or reduced flow regimes. The State Board should analyze impacts and propose mitigation. Restoration of flows to more natural conditions will help to improve water quality conditions and aquatic and riparian habitat in and downstream of the Project.

Fish Passage

Existing Project operations and facilities drastically disrupt native anadromous and resident fish migration. The Project completely precludes the passage of anadromous species above Iron Gate Dam at River Mile 190. The three Project dams in California on the mainstem Klamath River lack any passage facilities and block access to more than 400 miles of migration, spawning, and rearing habitat for native salmon, steelhead, and Pacific lamprey (Hamilton et al. 2005 and Huntington 2004 and 2006). The Department recommends that the State Board's Alternatives should either evaluate dam removal or an Alternative that includes mandatory conditions to provide fish passage facilities. Although fish ladders would allow for fish passage, they would also require continual maintenance, and outmigration success of juveniles is unknown. Alternatives which require dam removal would provide 100 percent passage; therefore, the Department prefers dam removal as an alternative to fish passage to address existing effects on fish migration.

Beyond precluding the restoration of anadromy, the Project facilities also disrupt seasonal migration patterns of resident salmonids. These facilities also diminish access to refugia and spawning habitats important for all native fish. This fragmentation is compounded by potentially lethal entrainment risks including risks to Lost River and Shortnose suckers, which are fully protected under FGC section 5515. The California facilities lack screens and other exclusionary devices to prevent entrainment and mortality to resident fish. The J.C. Boyle facility does have a screen, but it is inadequate and does not conform to current fishway criteria. Therefore, any alternative which contemplates the continued operation of the J.C. Boyle facility should update fishway criteria in consultation with the Department.

Disease

Disease of fish and fish-kills in the lower Klamath River downstream from the Project are a serious management concern. Fish disease among anadromous fish has increased in recent years in both adults and outmigrating juveniles in the lower Klamath River (Williamson and Foott 1998; Foott et al. 1999, 2002, 2003, Nichols and Foott 2005). The primary pathogens implicated in the disease outbreaks and fish-kills are the myxozoan parasites *Ceratomyxa shasta* and *Parvicapsulum minibicornis* (Williamson and Foott 1998; Foott et al. 1999; Foott et al. 2002; Foott et al. 2003).

The life cycles of the parasites endemic to the lower Klamath River are complex and require development in both a vertebrate and invertebrate host. For *C. shasta* the invertebrate host is the freshwater polychaete *Manayunkia speciosa* (Bartholomew et al. 1997). Fish become infected by contact with actinospores that are produced within *Manayunkia*. Following fish mortality, myxospores are released into the water where they are then taken up by the polychaete. The invertebrate host for *P. minibicornis* has not yet been identified, but new information suggests that its host may also be *Manayunkia*.

Algal buildup on substrate in the Klamath River is believed to increase the suitability of habitat for *Manayunkia* (Stocking and Bartholomew 2004). By increasing the number of myxozoan spores in the water column, the algal buildup contributes to higher infection rates. Project operations reduce the magnitude and duration of peak flows below Iron Gate Dam, exacerbating algal buildup and provide stable habitat for the polychaetes downstream of the Project (McKinney et al. 1999).

Beyond creating suitable conditions for the polychaetes, the Project contributes to higher water temperatures, further increasing the suitability for algal growth and disease risk in fish.

Outmigrating juvenile salmonids within the Lower Klamath River Basin experience significant mortality from infectious disease, with recent estimates of disease-related mortality in downstream migrants as high as 90 percent (Scott Foott, USFWS, personal communication). In the spring months of March through May, juvenile salmonids need temperatures above 10 to 13 degrees Celsius for optimal growth (EPA, 2003). The Project significantly delays the onset of these temperatures in the spring, slowing salmonid juvenile growth rates. By slowing juvenile growth rates, juvenile outmigration is likely delayed, subjecting juvenile Chinook to higher disease risk conditions. Outmigration of juvenile fall-run Chinook salmon would, under a more natural thermal regime occur before the summer months, in part, to avoid warmer temperatures. In the late summer and fall, the return of cooler water temperatures would more closely mimic natural daily and seasonal conditions favorable for rearing, migration, spawning, and incubation for anadromous salmonids, particularly fall-run Chinook salmon.

Bedload Transport

Project dams have diminished bedload sediment transport and gravel recruitment in the Hydroelectric Reach and downstream of Iron Gate Dam. Quantitative modeling and multiple studies indicate that dam removal would improve stream-bed mobility and gravel transport, creating better salmonid spawning and rearing areas, and decreasing juvenile salmon disease. The FERC EIS analyzed bed mobility for each reach using with- and without-project hydrology. Those results indicate that, except for the Link River and Keno reaches,

the project consistently increases the estimated discharge required to mobilize the bed. Project operations reduce the frequency of bed-mobilizing events from roughly an annual or semi-annual basis to about two times less frequent. This indicates that, without project operations, spawning gravels would be more frequently mobilized, flushed, and replenished from upstream. In the river reaches immediately downstream of Iron Gate Dam, results indicate that the bed is only mobilized on average every 4 to 9 years. More-frequent seasonal high flow events would refresh spawning gravels and disperse sediment across the channel (and potentially onto the floodplain, depending on the magnitude of the flow), benefiting aquatic and riparian habitats (FERC, 2007). The EIR should include analysis of bedload and spawning gravel transport under each alternative.

Hatchery Operations

The NOP correctly identifies that substantially new information has been developed under the KHSA process including the development of an environmental review document evaluating the impacts of dam removal (Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report, December 2012, State Clearinghouse No. 2010062060). We understand the State Board will use the information developed as part of their analysis. The Department recommends the State Board specifically include the requirements developed during the KHSA process for hatchery operations in their evaluation of any EIR alternative that includes dam removal. The hatchery and other artificial propagation can be utilized and contribute to the overall restoration efforts in the Klamath Basin.

Alternatives Analysis

The NOP notes the State Board staff has determined the FERC EIS does not fully comply with the requirements of CEQA, and therefore has determined it is necessary to prepare a separate EIR in conformance with CEQA Guidelines. The Department also agrees with the State Board staff regarding the FERC EIS that alternatives analyzed in the EIR should include mandatory conditions provided by the Department and the U.S. Departments of the Interior and Commerce.

The State Board's NOP mentions a possible range of alternatives (Alternatives) for consideration. In addition to the No Project Alternative, alternatives may include but are not limited to:

- PacifiCorp's Project as proposed in its August 2014 water quality certification application, updated with mandatory conditions;
- the FERC staff alternative with mandatory conditions;
- removal of the three mainstem Project facilities in California;

- removal of some or all of the California mainstem dams; and
- implementation of the KHSA measures to the extent that they affect California's environmental resources.

The Department supports the evaluation of these Alternatives. Specifically, the Department supports the State Board addition of the mandatory conditions to both PacifiCorp's Project proposal and the FERC staff alternative.

The FERC EIS identifies numerous, significant positive effects of decommissioning two or four Project facilities. These benefits include water quality improvements below Iron Gate Dam, restoration of historical anadromous fish habitat, elimination of fish passage barriers, and net annual power benefits when compared to installation of fishways. Negative and uncertain effects of dam removal regarding anadromous fish are described as generally short term and manageable. Indeed, from the analysis provided in the FERC EIS, dam removal appears to be the most beneficial course of action with regards to most significant issues.

To alleviate any concerns that may exist related to the economic costs of decommissioning and loss of power generation, the State Board should consider a report by the California Energy Commission (CEC), *"PacifiCorp's Klamath Hydroelectric Project: Transmittal of Economic and Energy Information from the California Energy Commission to Assist Public Utilities Commissions in Identifying the Least-Cost Project Alternative for Ratepayers."* The CEC provided this information to FERC and the California and Oregon public utility commissions to assist development of options that provide optimum benefits to ratepayers at lowest cost. Specifically, the CEC recommended:

"Based on the scientific, energy and economic evidence provided in this letter, the FERC proceeding administrative record, and in our reports, Energy Commission staff recommends that the California Public Utilities Commission authorize cost recovery only for the decommissioning scenario, which is the least-cost, environmentally superior project option for the Klamath Hydro Project."

In light of the high cost and low benefit ratio presented in the FERC EIS and detailed in the CEC report, it appears that any issues related to high economic costs of decommissioning and loss of power generation would be less compared to the continued operation of the Project.

The Department would also like to clarify that although the Klamath EIS/EIR identifies Partial Facilities Removal of Four Dams as the environmentally superior alternative, the Department also supports the Four Dam Removal alternative. Although retirement of

Parker Thaler
State Water Resources Control Board
January 29, 2016
Page 12

Copco 1 and Iron Gate or four dam removal alternatives would have the most short-term significant and unavoidable impacts, these impacts would largely be limited to the time frame of direct dam deconstruction actions and sediment release (see Klamath EIS/EIR). Dam removal alternatives would significantly improve water temperature, dissolved oxygen, and algal toxins for aquatic resources, and reduce the incidence of fish disease in juvenile salmon.

The State Board should analyze the effects of reservoir stratification on dissolved oxygen and water temperature for alternatives that maintain reservoirs, and any mitigation options. The analysis for the Klamath River Total Maximum Daily Load (North Coast Regional Water Quality Control Board 2010), determined Iron Gate and Copco reservoirs have significant impacts on dissolved oxygen and temperature, and there are no depths at which salmonids could be supported. No mitigations were identified in the FERC EIS to address this issue.

In summary, the Department determined Alternative 3 (Partial Facilities Removal of Four Dams) to be the environmentally superior alternative among all the alternatives because it provides many of the long-term beneficial environmental effects while reducing some of the short-term significant effects of the Proposed Action. Still, the Department remains supportive of the Department EIS/EIR Proposed Action: Alternative 2 (Full Facilities Removal of Four Dams) because it would also result in the most long-term beneficial environmental effects.

Conclusion

The Klamath Hydroelectric Project is causing irreparable harm to the State's fish and wildlife resources. The State Board should use information presented in the FERC EIS and Klamath EIS/EIR. Based on current information and analysis, the Department's position is that dam removal alternatives are superior for conservation of fish and wildlife resources.

The Department appreciates the opportunity to provide comments on the NOP. If you have any questions concerning these comments, please contact Senior Environmental Scientist (Specialist) Matt Myers at (530) 225-3846 or matt.myers@wildlife.ca.gov.

Sincerely,

Neil Manji
Regional Manager

ec: Page 13

References: Page 13

cc: State Clearinghouse
state.clearinghouse@opr.ca.gov

Curt Babcock, Curtis Milliron, Tony LaBanca, Donna L. Cobb, Matt Myers,
Caitlin Bean, Suzanne Turek, Jennifer Bull, Wade Sinnen, Morgan Knechtle,
Kevin Takei

California Department of Fish and Wildlife

Curt.babcock@wildlife.ca.gov, Curtis.milliron@wildlife.ca.gov,
tony.labanca@wildlife.ca.gov, donna.cobb@wildlife.ca.gov,
matt.myers@wildlife.ca.gov, Caitlin.bean@wildlife.ca.gov,
Suzanne.turek@wildlife.ca.gov, Jennifer.bull@wildlife.ca.gov,
wade.sinnen@wildlife.ca.gov, morgan.knechtle@wildlife.ca.gov,
kevin.takei@wildlife.ca.gov

References:

- Bartholomew, J. L., M. J. Whipple, D. G. Stevens, and J. L. Fryer. 1997. "The Life Cycle of *Ceratomyxa Shasta*, A Myxosporean Parasite of Salmonids, Requires a Freshwater Polychaete as an Alternate Host." Journal of Parasitology: 83(5): 859-868.
- California Energy Commission. 2003. Preliminary assessment of energy issues associated with the Klamath Hydroelectric Project. California Energy Commission Report. Prepared for the California Resources Agency and State Water Resources Control Board.
- Department of the Interior. 2012. *Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report*
- Environmental Protection Agency. 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards.
- Federal Energy Regulatory Commission. 1963. Opinion No. 381. Opinion and Order on Petition to Require Licensee to Construct, Operate, and Maintain a Fish Hatchery, Amending License and Directing Revised Filings. March 14, 1963. 13 pp.
- Federal Energy Regulatory Commission. 2007. Final Environmental Impact Statement for Hydropower License Volume I. November 2007. 3-35 pp.
- Foott, J. S., J. D. Williamson, and K. C. True. 1999. FY95 Investigational Report: Health, Physiology, and Migration Characteristics of Iron Gate Hatchery Chinook, 1995 Releases, USDI Fish and Wildlife Service and California-Nevada Fish Health Center: 1-51.

- Foott, J. S., T. Martinez, R. Harmon, K. C. True, B. McCasland, C. Glace, and R. Engle. 2002. FY2001 Investigational Report; Juvenile Chinook Health Monitoring in the Trinity River, Klamath River, and Estuary. Anderson, CA, U. S. Fish and Wildlife Service, California - Nevada Fish Health Center. 30 pp.
- Foott, J. S., R. Harmon, and R. Stone. 2003. FY2002 Investigational Report: Ceratomyxosis resistance in juvenile chinook salmon and steelhead from the Klamath River. Anderson, CA, U.S. Fish and Wildlife Service California - Nevada Fish Health Center. 25 pp.
- Hamilton, J. B., G. L. Curtis, S. M. Snedaker, and D. W. White. 2005. Distribution of anadromous fishes in the upper Klamath River watershed prior to hydropower dams—a synthesis of the historical evidence. *Fisheries*. 30(4): 34 pp.
- Handeland, K. and O. Ostensvik. 2010. Microcystin poisoning in roe deer (*Capreolus capreolus*). *TOXICON* 56 (6): 1076-78.
- Huntington, C. W. 2004. Preliminary estimates of the recent and historic potential for anadromous fish production in the Klamath River above Iron Gate Dam. Chiloquin, Oregon. Prepared for the Klamath Tribes. 11pp.
- Huntington, C. W. 2006. Estimates of anadromous fish runs above the site of Iron Gate Dam. Chiloquin, Oregon. Prepared for the Klamath Tribes. 5pp.
- Institute for Fisheries Resources. 2004. Letter to PacifiCorp RE: FERC 2082 - Klamath Hydro Project Comments on the Final License Application. Eugene OR. 32 pp.
- Matthews, K. R. and N. H. Berg. 1997. "Rainbow trout responses to water temperature and dissolved oxygen stress in two southern California stream pools." *Journal of Fish Biology* 50: 50-67.
- McKinney, T., R. S. Rogers, and W. R. Persons. 1999. "Effects of Flow Reductions on Aquatic Biota of the Colorado River Below Glen Canyon Dam, Arizona." *North American Journal of Fisheries Management* 19: 984-991.
- Nichols, K. and J.S. Foott. 2005. FY 2004 Investigational Report: Health Monitoring of Juvenile Klamath River Chinook Salmon. Anderson, CA, USFWS-CA/Nev Fish Health Center. 15 pp.
- North Coast Regional Water Quality Control Board. 2001. Water Quality Control Plan for the North Coast Region. Santa Rosa, CA.

- North Coast Regional Water Quality Control Board. 2010. Klamath River Total Maximum Daily Loads (TMDLs) Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California, Proposed Site Specific Dissolved Oxygen Objectives for the Klamath River in California, Klamath River and Lost River Implementation Plans. Santa Rosa, CA. <http://www.waterboards.ca.gov/northcoast>
- Schreck, C. B. and H. W. Li. 1991. Performance Capacity of Fish: stress and water quality. In: Aquaculture and Water Quality, Advances in World Aquaculture 3. D. E. Brune and J. R. Tomasso. Baton Rouge, LA. World Aquaculture Society: 21-29.
- Shirkey, N., B. Gonzales, and L. Woods. 2015. Update on Adenovirus Infection in Mule Deer (*Odocoileus hemionus*) 2014-2015 as of 7/30/15. Wildlife Investigations Lab, California Department of Fish and Wildlife and the California Animal Health and Food Safety Laboratory.
- Stocking, R. W. and J. L. Bartholomew. . 2004. Assessing links between water quality, river health and Ceratomyxosis of salmonids in the Klamath River system, Department of Microbiology, Oregon State University: file memorandum, 4 pp.
- U.S. Fish and Wildlife Service. 2012. Revised Recovery Plan for the Lost River Sucker (*Deltistes luxatus*) and Shortnose Sucker (*Chasmistes brevirostris*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, CA. xviii + 122pp.
- Williamson, J. D. and J. S. Foott. 1998. Diagnostic Evaluation of Moribund Juvenile Salmonids in the Trinity and Klamath Rivers (June-Sept 1998). Anderson, California, USDI Fish and Wildlife Service, California-Nevada Fish Health Center. pp. 1-30.

- North Coast Regional Water Quality Control Board. 2010. Klamath River Total Maximum Daily Loads (TMDLs) Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California, Proposed Site Specific Dissolved Oxygen Objectives for the Klamath River in California, Klamath River and Lost River Implementation Plans. Santa Rosa, CA. <http://www.waterboards.ca.gov/northcoast>
- Schreck, C. B. and H. W. Li. 1991. Performance Capacity of Fish: stress and water quality. In: Aquaculture and Water Quality, Advances in World Aquaculture 3. D. E. Brune and J. R. Tomasso. Baton Rouge, LA. World Aquaculture Society: 21-29.
- Shirkey, N., B. Gonzales, and L. Woods. 2015. Update on Adenovirus Infection in Mule Deer (*Odocoileus hemionus*) 2014-2015 as of 7/30/15. Wildlife Investigations Lab, California Department of Fish and Wildlife and the California Animal Health and Food Safety Laboratory.
- Stocking, R. W. and J. L. Bartholomew. . 2004. Assessing links between water quality, river health and Ceratomyxosis of salmonids in the Klamath River system, Department of Microbiology, Oregon State University: file memorandum, 4 pp.
- U.S. Fish and Wildlife Service. 2012. Revised Recovery Plan for the Lost River Sucker (*Deltistes luxatus*) and Shortnose Sucker (*Chasmistes brevirostris*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, CA. xviii + 122pp.
- Williamson, J. D. and J. S. Foott. 1998. Diagnostic Evaluation of Moribund Juvenile Salmonids in the Trinity and Klamath Rivers (June-Sept 1998). Anderson, California, USDI Fish and Wildlife Service, California-Nevada Fish Health Center. pp. 1-30.