

EXECUTIVE SUMMARY

On September 23, 2016, the Klamath River Renewal Corporation (KRRC) applied to the Federal Energy Regulatory Commission (FERC) to remove the dams and associated facilities that together form the Lower Klamath Project (FERC Project No. 14083). The KRRC's goal is to create a free-flowing Klamath River and provide for volitional fish passage in the Klamath River currently occupied by the Lower Klamath Project. The Lower Klamath Project consists of four dams: (J.C. Boyle; Copco No. 2; Copco No. 1; and Iron Gate) and their associated facilities (e.g., powerhouses, penstocks and power lines). The Lower Klamath Project (FERC Project No. 14803) is currently part of the Klamath Hydroelectric Project (FERC Project No. 2082), which is owned and operated by PacifiCorp. The Klamath Hydroelectric Project also includes several additional hydropower facilities (e.g., Fall Creek, East Side, West Side and Keno).

Also on September 23, 2016, the KRRC applied to the California State Water Resources Control Board (State Water Board) for water quality certification for the Proposed Project, pursuant to section 401 of the Clean Water Act. The State Water Board's water quality certification addresses water quality in California. The State Water Board is the lead agency for the California Environmental Quality Act (CEQA), which requires analysis of the environmental impacts of projects that can affect the environment. This Environmental Impact Report (EIR) was prepared to conform with CEQA. It focuses primarily on impacts related to actions proposed for the California portion of the Proposed Project. Actions at the J.C. Boyle Dam complex, located in Klamath County, Oregon, and other actions of the Proposed Project in Oregon, are described in general terms, but the discussion of actions in Oregon are limited to those with the potential to adversely impact the California environment. Oregon's Department of Environmental Quality issued a separate water quality certification for the Proposed Project that addresses water quality impacts in Oregon, including removal of the J.C. Boyle Dam complex. FERC and other federal agencies will analyze impacts of the Proposed Project in both states.

Proposed Project Location

The Lower Klamath Project is located on, and adjacent to, the Klamath River in Siskiyou County, California, and in Klamath County, Oregon (Figure ES-1). The State Water Board has identified the Project Boundary as inclusive of the Proposed Project "Limits of Work", as well as PacifiCorp owned and managed lands immediately surrounding the Lower Klamath Project ("Parcel B lands"), that would be transferred as part of the Proposed Project (Figure ES-2). The nearest city to the California portion of the Proposed Project is Yreka, which is located 20 miles southwest of the downstream end of the Proposed Project. The California portion of the Proposed Project includes the following three dams and associated facilities: Copco No. 1 Dam (River Mile [RM] 201.8), Copco No. 2 Dam (RM 201.5), and Iron Gate Dam (RM 193.1). For purposes of analyses conducted in this EIR, the California portion of the Klamath River system has been divided into four (4) reaches as follows: Hydroelectric Reach, Middle Klamath River, Lower Klamath River, and Klamath River Estuary (Figure ES-1).

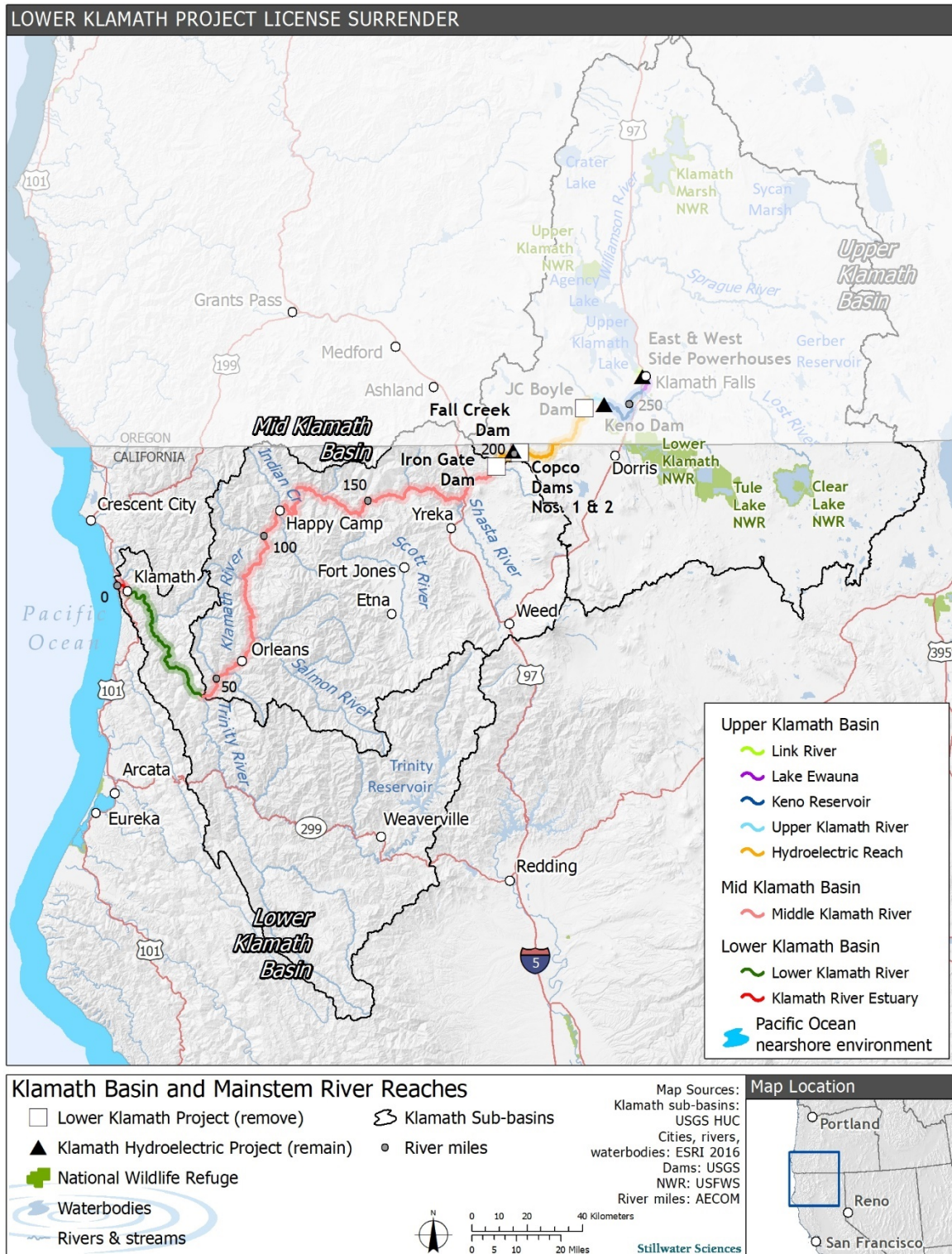


Figure ES-1. Klamath Basin and Mainstem River Reaches.

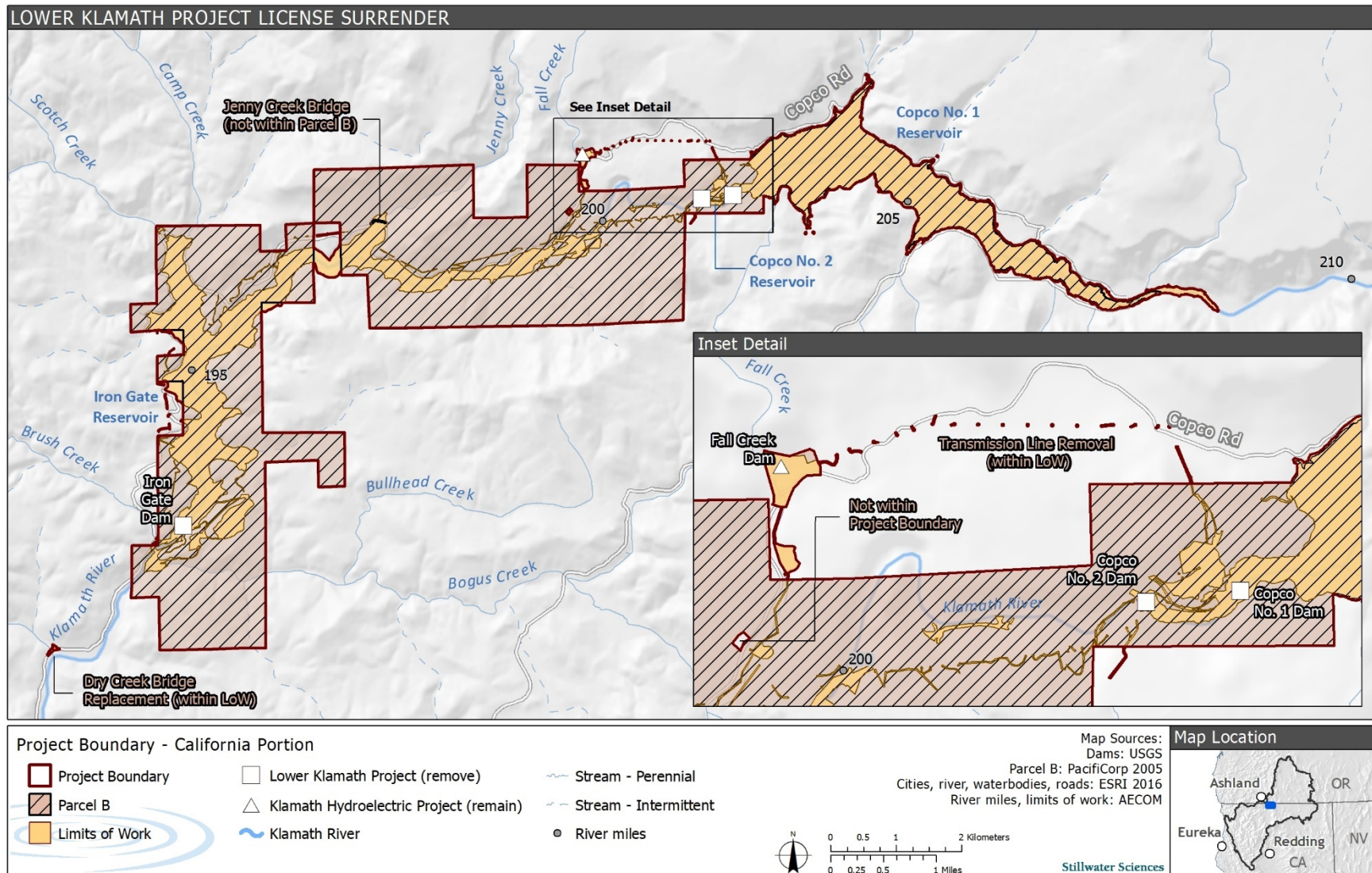


Figure ES-2. Proposed Project Boundary – California Portion.

Proposed Project Objectives

The State Water Board has identified the following Proposed Project objectives, as required under CEQA Guidelines, section 15124, subdivision (b):

In a timely manner:

1. Improve the long-term water quality conditions associated with the Lower Klamath Project in the California reaches of the Klamath River, including water quality impairments due to *Microcystis aeruginosa* and associated toxins, water temperature, and levels of biostimulatory nutrients.
2. Advance the long-term restoration of the natural fish populations in the Klamath Basin, with particular emphasis on restoring the salmonid fisheries used for subsistence, commerce, tribal cultural purposes, and recreation.
3. Restore volitional anadromous fish passage in the Klamath Basin to viable habitat currently made inaccessible by the Lower Klamath Project dams.
4. Ameliorate conditions underlying high disease rates among Klamath River salmonids.

The objectives further the underlying purpose of the Proposed Project, which is the timely improvement of water quality related to the Lower Klamath Project within and downstream of the current Hydroelectric Reach and the restoration of anadromous access upstream of Iron Gate Dam (the current barrier to anadromy).

Proposed Project

Dam and Powerhouse Deconstruction

The Proposed Project includes the deconstruction of the J.C. Boyle Dam and Powerhouse, Copco No. 1 Dam and Powerhouse, Copco No. 2 Dam and Powerhouse, and Iron Gate Dam and Powerhouse, as well as associated features. Associated features vary by powerhouse, but generally include: powerhouse intake structures, embankments and sidewalls, penstocks and supports, decks, piers, gate houses, fish ladders and holding facilities, pipes and pipe cradles, spillway gates and structures, diversion control structures, tunnels, aprons, sills, tailrace channels, footbridges, powerhouse hazardous materials, transmission lines, switchyards, a remnant cofferdam near Copco No. 2 Dam, portions of the Iron Gate Fish Hatchery, and various buildings. To access the dams for deconstruction, the KRRRC would perform a controlled reservoir drawdown using both existing and modified infrastructure. Dam demolition would occur over approximately four months using multiple techniques, including blasting and hydraulic excavators. In addition, road maintenance, improvements and rehabilitation; culvert replacements; and bridge protection, strengthening, or replacement, would occur at numerous locations within the Proposed Project Limits of Work to support construction activities.

Anticipated import materials include gravel, sheetpile or H-piles, topsoil, seed and mulch materials, ready-mix concrete, reinforcing steel, mechanical equipment materials for the road, bridge and culvert improvements/replacements, and signage. Staging areas and disposal sites would also be created for each of the dams within the Proposed Project Limits of Work, and offsite waste disposal would likely be hauled to the Yreka Transfer

Station (Class III sanitary landfill). Hazardous materials would be handled and disposed of in accordance with applicable regulations.

Reservoir Drawdown

Copco No. 1 Reservoir would be drawn down first (November–March of dam removal year 1)¹, followed by J.C. Boyle (Oregon) and Iron Gate reservoirs (January–March of dam removal year 2). Copco No. 2 Reservoir is substantially smaller than the other three dams and the KRRC proposes to drawdown this reservoir after Copco No. 1 Dam has been breached to final grade in May of dam removal year 2. The proposed drawdown period was designed to: (1) balance the water quality impacts of dam removal across different life stages of aquatic species in the Middle and Lower Klamath River reaches; (2) use naturally high winter flows to flush sediments trapped in the reservoirs as quickly as possible; and (3) permit power generation revenues for the period specified in the Klamath Hydroelectric Settlement Agreement (KHSA). For all reservoirs, the minimum drawdown rate would be two feet per day, and the maximum drawdown rate would be five feet per day, until drained.

The maximum average flow releases would be: 138 cfs at J.C. Boyle Dam (Oregon), 762 cfs at Copco No. 1 Dam, and 822 cfs at Iron Gate Dam. These releases correspond to three percent, 13 percent, and 14 percent of the two-year peak flow in the Klamath River, and one percent, seven percent, and six percent of the 10-year peak flow in the Klamath River, respectively. These maximum rates would occur during dry periods, with slower drawdown (lower flow releases) occurring during storm events. During Iron Gate Dam removal, the embankment dam crest would be retained at a level to accommodate the passage of a 100-year flood event.

Power generation at Copco No. 1 Dam would end after the reservoir reaches the minimum operating level at reservoir surface elevation 2,604.5 feet, in November of dam removal year 1. If power generating equipment proves capable under sediment-laden conditions, power generation at Copco No. 2 Dam could continue until May of dam removal year 2. At J.C. Boyle (Oregon) and Iron Gate dams, power generation would cease on January 1 of dam removal year 2.

Reservoir Sediment Deposits and Erosion During Drawdown

There would be an estimated 15.1 million cubic yards (14.6 million tons) of sediment stored in the J.C. Boyle, Copco No. 1, and Iron Gate reservoirs by 2020 (USBR 2012). Between 2020 and 2021 (i.e., dam removal year 2, when drawdown is anticipated to primarily occur) the sediment volume present behind the dams would increase by approximately 81,300 cubic yards in Copco No. 1 Reservoir and approximately 100,000 cubic yards in Iron Gate Reservoir based on estimates of annual sedimentation rates for each reservoir (USBR 2012). The increase in sediment volume between 2020 and 2021 would be an order of magnitude less than the uncertainty of the 2020 total sediment volume estimates, so the 2020 sediment volumes provide a reasonable estimate for 2021 and thus for the Proposed Project. Copco No. 2 Reservoir does not retain

¹ The Proposed Project schedule is broken down into calendar years: pre-dam removal years 1–3, dam removal year 1, dam removal year 2, and post-dam removal years 1 through 10. See Table 2.7-1 for detailed schedule of Proposed Project activities.

appreciable amounts of sediment, because of its smaller size and location, and would not appreciably contribute to sediment transport during the drawdown of the reservoirs.

Approximately 85 percent of the sediment stored behind the reservoirs is fine (silt and clay), which would be easily eroded during drawdown, and only approximately 15 percent is coarse (sand and larger). Approximately 36 to 57 percent of the total sediment stored in J.C. Boyle, Copco No. 1, and Iron Gate reservoirs by 2021 is expected to be eroded and transported downstream during the drawdown period and the year following dam removal (i.e., short-term), which is equivalent to 5.4 to 8.6 million cubic yards (1.2 to 2.3 million tons). The range in the estimated volume of sediment eroded from each reservoir is primarily dependent upon whether the prevailing hydrology during reservoir drawdown corresponds to a dry hydrologic year or a wet hydrologic year, with less erosion expected in a dry year. The majority of the erosion would occur during the reservoir drawdown process and would be a combination of direct erosion of sediment by moving water, slumping of the fine sediment along the reservoir sides toward the river, and sediment jetting of some areas of reservoir-deposited sediments during drawdown. The short-term (i.e., two years following dam removal) effects of the Proposed Project on dam-released sediment and sediment resupply would likely extend from Iron Gate Dam to approximately Cottonwood Creek (USBR 2012). Most of the fine sediment is expected to be transported in suspension to the ocean shortly after being eroded. Fine sediment erosion would result in elevated suspended sediment concentrations downstream of Iron Gate Dam in the short term (Stillwater Sciences 2010, USBR 2012). Coarse sediment transport would occur more slowly and would be dependent on the frequency and magnitude of mobilizing flows and attenuation by channel storage.

Restoration within the Reservoir Footprint

The following sequence describes the activities that would be implemented in the former reservoir footprints to manage remaining sediment deposits and restore habitat.

- *Pre-dam removal* (pre-dam removal year 3, and dam removal year 1): collect and propagate seed and control invasive plants.
- *Reservoir drawdown* (January to March, dam removal year 2): revegetate exposed reservoir areas during and following drawdown by hydroseeding with a pioneer seed mix that contains common native plant species and sterile wheat mixed with a mycorrhizal inoculant and is capable of dealing with poor soil conditions, inclement weather, and complex hydrology, and by installing acorns, shrub seedlings, and pole cuttings. Permanent wildlife-friendly cattle exclusion fencing would be installed around the reservoir restoration areas where they abut grazing lands prior to drawdown, or shortly after the pioneer seeding.
- *Post-drawdown first summer/fall* (dry season immediately after drawdown during dam removal year 2): monitor and rectify any non-natural fish passage barriers, conduct additional fall overseeding on exposed areas, install riparian trees and shrubs, and install an irrigation system in the Bank Riparian Zone that would provide water for the duration of the KRRC maintenance and monitoring period.
- *Post-dam removal* (post-dam removal year 1): maintain vegetation, continue to remove and treat invasive exotic vegetation, install floodplain and off-channel habitat features, such as large wood. Monitor and rectify any non-natural fish passage barriers in mainstem and tributaries.

- *Establishment period* (post-dam removal years 2 through 5): continued monitoring and maintenance of vegetation, removal of invasive exotic vegetation, fish passage monitoring, and enhancement of habitat features as needed.
- *Long term* (post-dam removal years 5 through 10): continued monitoring and adaptive management, removal of invasive exotic vegetation, and fish passage monitoring. Vegetation restoration would be monitored for five years, or until the relevant performance criteria associated with minimizing invasive exotic vegetation, enhancing native plant diversity, and survival of planted trees and shrubs, have been met.

Restoration of Upland Areas Outside of the Reservoir Footprint

The following activities would be implemented in upland areas outside of the reservoirs' footprints:

- *Pre-dam removal*: active management of invasive exotic vegetation, which may include grazing, manual weed extraction, solarization (covering ground areas with black visqueen), tilling, and use of herbicides. Additionally, native plants would be prepared by collecting seeds and working with local nurseries to grow trees and shrubs.
- *Construction/deconstruction period*: protection of native trees.
- *Post-dam removal*: restoration of upland disposal, staging, temporary access, infrastructure demolition, and former recreation areas, including activities such as addressing compaction and broadcast-seeding with a native seed mix. Soils would be disked and ripped in preparation for planting. A temporary irrigation system may be installed in upland areas, if required.

Fish Hatcheries

During demolition, some Iron Gate Hatchery facilities located at the base of Iron Gate Dam would be removed, along with the cold-water supply and aerator for the hatchery. However, operational components of Iron Gate Hatchery would be retained and modified to continue operations at a reduced rate for just Chinook salmon and to eliminate coho salmon production. The nearby Fall Creek Hatchery, located at Fall Creek just upstream of Iron Gate Reservoir, would be reopened to maintain the current Iron Gate coho salmon production and some Chinook salmon production. The Iron Gate and Fall Creek hatcheries would remain in operation for eight years following removal of the dams, at which point the hatcheries would cease operations

City of Yreka Water Supply Pipeline Relocation

The City of Yreka receives its water supply from Fall Creek, a tributary to the Klamath River in the Upper Klamath Basin, approximately 23 miles northeast of the City of Yreka. At the upstream end of Iron Gate Reservoir, the pipeline crosses the reservoir and is minimally buried in the reservoir bed. To prevent damage to the pipeline, a replacement pipe crossing would be installed before dam removal and reservoir drawdown. The replacement pipe crossing would consist of one of the following three options:

- A new buried pipeline by micro-tunneling in the immediate vicinity of the existing pipeline crossing.

- A new aerial pipeline on a dedicated utility pipe crossing in the immediate vicinity of the existing pipeline crossing.
- A combination of a new buried pipeline and an aerial pipeline crossing on the existing timber traffic bridge along Daggett Road located approximately 2,000 feet upstream of the existing pipeline crossing.

Other Project Components

Other Proposed Project components include:

- **Aquatic Resource Measures** – surveys and protection measures for mainstem spawning and outmigrating juveniles; delayed release of hatchery fish from Iron Gate Fish Hatchery to avoid poor water quality; and surveys and relocation of suckers and freshwater mussels.
- **Terrestrial Resource Measures** – stabilization of remaining sediments and restoration of reservoir and other disturbed areas for habitat restoration; and surveys and avoidance and minimization measures for nesting birds, bald and golden eagles, special-status bats, northern spotted owl, and special-status plants.
- **Transportation and Traffic** – improve roads, bridges and culverts affected by the Proposed Project construction and ongoing maintenance.
- **Recreation** – implementation of a Recreation Plan, which includes removal of numerous existing recreation facilities, and restoration with native vegetation before, during and after dam removal at J.C. Boyle Reservoir, Copco No. 1 Reservoir, Iron Gate Reservoir, and dispersed recreation sites; initiates process to add new river-based recreation opportunities.
- **Downstream Flood Control** – maintain existing flood protection.
- **Management and Other Plans** – Cultural Resources Plan, Traffic Management Plan, Water Quality Monitoring Plan, Groundwater Well Management Plan, Fire Management Plan, Hazardous Material Management Plan, Emergency Response Plan, and Noise and Vibration Control Plan.

Land Disposition

Before dam removal, PacifiCorp would transfer most of the lands immediately surrounding the Lower Klamath Project (“Parcel B lands”) to the KRRC. The Proposed Project provides that, after dam removal, the KRRC would transfer Parcel B lands to California or Oregon or to a designated third-party for public interest purposes, as described under KHSA Section 7.6.4.

Summary of Proposed Project Effects, Potential Impacts, and Potential Cumulative Impacts

Table ES-1 (located after the Executive Summary *References*) summarizes the potential impacts examined in this EIR. For each potential impact, it lists the significance of the potential impact for the Proposed Project (and for each of the alternatives analyzed), and whether these potential impacts would be short term or long term. The table also notes mitigation measures that could reduce the severity of potentially significant impacts.

The largest number of adverse impacts under the Proposed Project would be impacts due to reservoir drawdown (and the resulting sediment discharge) and from dam removal activities; however, many of these impacts would be reduced through proposed mitigation for the resource areas listed above. Additionally, many of these impacts would be short term. Mitigation measures are listed in Table ES-1. All mitigation measures would be included in a Mitigation, Monitoring, and Reporting Program (MMRP).

Effects with No Significant Impact (with or without Mitigation)

As shown in Table ES-1, most of the potential impacts assessed in this EIR would result in no significant impact or no significant impact with mitigation. The Proposed Project itself, or the Proposed Project with proposed mitigation measures, would result in no significant impact for one or more impacts in all resource areas.

Effects Found to be Beneficial

A summary, by resource area, of effects found to be beneficial for the Proposed Project is provided below. These effects are also summarized in Table ES-1, along with effects found to be beneficial for the alternatives.

Water Quality

- Short-term and long-term water temperature improvements in the Hydroelectric Reach and the Middle Klamath River to the confluence with the Salmon River;
- Short-term and long-term elimination of summer and fall extremes in dissolved oxygen concentrations in the Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam;
- Short-term and long-term decreases in summer and fall pH and daily pH fluctuations in the Hydroelectric Reach from Copco No. 1 Reservoir to Iron Gate Dam; and
- Short-term and long-term reduction of chlorophyll-a and algal toxins for the Hydroelectric Reach, the Middle and Lower Klamath River, and the Klamath River Estuary.

Aquatic Resources

- Long-term effects on in coho salmon critical habitat quality and quantity;
- Long-term effects on Chinook and coho salmon Essential Fish Habitat (EFH) quality and quantity;

- Long-term beneficial effects on the fall-run Chinook salmon population due to increased habitat quality and quantity;
- Long-term beneficial effects on the spring-run Chinook salmon population due to increased habitat quality and quantity;
- Long-term beneficial effects on the coho salmon population due to increased habitat quality and quantity;
- Long-term beneficial effects on the steelhead population due to increased habitat quality and quantity;
- Long-term beneficial effects on the Pacific lamprey population due to increased habitat quality and quantity;
- Long-term beneficial effects on the redband trout population due to increased habitat quality and quantity;
- Short-term and long-term beneficial effects on species interactions between introduced resident fish species and native aquatic species due to short- and long-term changes in habitat quality and quantity; and
- Long-term beneficial effects on benthic macroinvertebrate habitat quality.

Phytoplankton and Periphyton

- Long-term change in the spatial extent, temporal duration, transport, or concentration of nuisance and/or noxious phytoplankton blooms and concentrations of algal toxins in the Hydroelectric Reach, Middle and Lower Klamath River, and Klamath River Estuary.

Terrestrial Resources

- Long-term beneficial effects on riparian habitat downstream of the Lower Klamath Project due to sediment deposition and the creation of new surfaces for colonization;
- Long-term beneficial effects on willow flycatcher from additional riparian habitat in the former location of Copco No. 1 and Iron Gate reservoirs;
- Long-term beneficial effects on special-status amphibians and reptiles in riverine habitats from improved water quality;
- Long-term beneficial effects on benthic macroinvertebrates due to increased habitat availability and improved habitat quality;
- Long-term beneficial effects on deer from an increase in winter range habitat;
- Long-term beneficial effects on rare natural communities, wetlands, and riparian vegetation from herbicide use during reservoir restoration that would improve habitat conditions by reducing competition from invasive species;
- Effects on wildlife from increased habitat for salmonid spawning, production, and migration and increase in prey and overall nutrient distribution;
- Long-term effects on wildlife from increased wildlife movement opportunities; and
- Long-term effects on terrestrial wildlife from an increase in the distribution of salmon-derived nutrients upstream of Iron Gate, Copco No. 1 and Copco No. 2 dams.

Flood Hydrology

- Long-term decrease in the risk of dam failure resulting in flooding of areas downstream of the Lower Klamath Project.

Geology, Soils, and Mineral Resources

- Long-term increase in sediment supply and transport, creating a more dynamic and mobile riverbed within the Hydroelectric Reach and downstream of Iron Gate Dam.

Historical Resources and Tribal Cultural Resources

- Klamath Riverscape Contributing Aspect – long-term beneficial effects on the Klamath River fishery of predicted increases in fish production and health from dam removal and the long-term benefits on much of the key tribal trust species (e.g., Chinook salmon, coho salmon, steelhead, and Pacific lamprey) resulting from improved river ecosystem function and increased habitat access; and
- Klamath Riverscape Contributing Aspect – long-term increase in the ability of tribes to access and use the Middle and Lower Klamath River for ceremonial and other purposes due to improvements in riverine water quality and reductions in seasonal blue-green algae blooms in Copco No. 1 and Iron Gate reservoirs.

Recreation

- Increased recreational fishing opportunities due to increased habitat access for salmonids and improved water quality; and
- Long-term beneficial effects on California Klamath Wild and Scenic River resources due to a return to more natural conditions and improved water quality, and scenic, wildlife, fishery, and recreation river values.

Significant Unavoidable Adverse Impacts

Below is a summary, by resource area, of impacts found to be ‘significant and unavoidable’ with or without mitigation (Table ES-1). Please note, the KRRC proposes to further develop Proposed Project actions relating to certain state and local regulatory requirements for several resource areas that fall outside of State Water Board’s water quality certification authority. The State Water Board anticipates implementation of additional measures (e.g., good neighbor agreements between the KRRC and relevant state or local agencies, recommended measures in this EIR, and any modifications developed through the FERC process that provide the same or better level of protection for the resource in question) would reduce impacts. The EIR notes where such protection would eliminate the potential for a significant impact. However, the State Water Board cannot ensure implementation of good neighbor agreements, recommended measures included in this EIR, or modifications anticipated to be developed through the FERC process. Therefore, the State Water Board has identified impacts that rely on implementation of such agreements or recommended measures in this EIR as significant and unavoidable.

Water Quality

- Short-term increases in suspended sediments in the Hydroelectric Reach, Middle and Lower Klamath River, Klamath River Estuary, and the Pacific Ocean nearshore environments due to release of sediments currently trapped behind the Lower Klamath Project dams;
- Short-term increases in oxygen demand and reductions in dissolved oxygen due to release of sediments currently trapped behind the Lower Klamath Project dams in the Hydroelectric Reach and Middle Klamath River from Iron Gate Dam to the Salmon River; and
- Short-term increases in water temperature and reductions in dissolved oxygen in Fall Creek downstream of Fall Creek Hatchery due to hatchery operations.

Aquatic Resources

- Short-term impacts on native freshwater mussels (*Anodonta spp.*) due to elevated suspended sediment concentrations (SSCs) during reservoir drawdown and long-term impacts due to elimination of reservoir habitat in the Hydroelectric Reach and relatively stable flow regime in the Middle Klamath River immediately downstream of Iron Gate Dam.

Phytoplankton and Periphyton

- Potential for short-term and long-term increases in the growth of nuisance periphyton species along the margins of the newly created low gradient river channels in the Hydroelectric Reach.

Terrestrial Resources

- Short-term impacts on special-status plants from construction-related activities within the Limits of Work;
- Short-term and long-term impacts on special-status wetland plants surrounding the reservoirs due to removal of Copco No. 1, Copco No. 2, and Iron Gate reservoirs;
- Short-term impacts on special-status mammals (bats, gray wolf, American badger) from construction-related activities within the Limits of Work;
- Short-term impacts on nesting birds from construction-related noise and habitat removal within and surrounding the Limits of Work;
- Short-term impacts on willow flycatcher from construction-related noise disturbance and habitat removal at Copco No. 1 and Iron Gate reservoirs;
- Short-term impacts on bald and golden eagles from construction-related noise and nesting habitat alterations at Copco No. 1, Copco No. 2, and Iron Gate reservoirs;
- Short- and long-term impacts on special-status bats, maternity roosts, and hibernacula from construction noise and loss of roosting habitat at existing Lower Klamath Project facilities; and
- Short-term impacts on sensitive habitats and special-status terrestrial wildlife and plant species from construction activities on Parcel B lands.

Flood Hydrology

- Long-term change in the Federal Emergency Management Agency (FEMA) 100-year floodplain inundation extent from Iron Gate Dam (RM 193) to Humbug Creek (RM 174), potentially exposing existing structures, which cannot feasibly be moved or elevated, to a substantial risk of flood damage and/or loss.

Air Quality

- Short-term exceedances of the Siskiyou County Air Pollution Control District total daily emissions thresholds for NO_x, PM₁₀, and PM_{2.5}² during dam removal construction activities.

Historical Resources and Tribal Cultural Resources

- Exposure of or damage to known Tribal Cultural Resources and historic-period archaeological sites through pre-dam removal ground-disturbing construction and disposal activities and increased access to sensitive areas;
- Shifting, erosion, and exposure of known or unknown, previously submerged Tribal Cultural Resources and historic-period archaeological sites, due to reservoir drawdown;
- Erosion or flood disturbance to Tribal Cultural Resources and historic-period archaeological sites located along the Middle Klamath River from Iron Gate Dam to Humbug Creek;
- Physical disturbance of known or unknown tribal cultural resources and historic-period archaeological sites that directly overlap with locations where blasting and other removal techniques would occur;
- Physical disturbance of known Tribal Cultural Resources and historic-period archaeological sites from ground disturbance associated with reservoir restoration, recreation site removal and/or development, disposal site restoration, and ongoing road and recreation site maintenance;
- Increased potential for looting of Tribal Cultural Resources during and following drawdown at Iron Gate, Copco No. 1 and Copco No. 2 reservoirs;
- Exposure or disturbance to known or unknown Tribal Cultural Resources within the reservoir footprints immediately following reservoir drawdown and prior to vegetation establishment/full stabilization of sediment deposits because of erosion caused by high-intensity and/or duration precipitation events;
- Impacts to Tribal Cultural Resources as a result of dam removal from increased looting opportunities and from surface and subsurface erosion of Tribal Cultural Resources;
- Impacts to the historical significance of the Klamath River Hydroelectric Project District due to facilities removal; and

² Nitrogen oxides (NO_x), particulate matter with a diameter of 10 microns or less (PM₁₀), and particulate matter with a diameter of 2.5 microns or less (PM_{2.5}).

Public Services

- Increases in public service response times for emergency fire, police, and medical services due to construction and demolition activities, including construction-related traffic; and
- Substantial increase in response times for suppressing wildland fires where suitable replacement water sources cannot be identified in close proximity to a fire in a location for which the Lower Klamath Project reservoirs would otherwise have been the nearest water source.

Aesthetics

- Short-term visual changes resulting from reservoir drawdown, including temporarily bare/unvegetated banks;
- Long-term visual changes resulting from new recreation facilities; and
- Short-term impacts to nighttime views in the area from new sources of substantial light or glare from construction or security lighting.

Recreation

- Changes to or loss of river conditions that support whitewater boating in the Hell's Corner reach in the upper portion of the Hydroelectric Reach.

Hazards and Hazardous Substances

- Construction-related traffic may interfere with emergency response on rural roads surrounding the Lower Klamath Project.
- Substantial increase in public's risk of loss, injury or death associated with wildland fires where suitable replacement water sources cannot be identified in close proximity to a fire in a location for which the Lower Klamath Project reservoirs would otherwise have been the nearest water source.

Transportation and Traffic

- Increase in traffic in excess of the capacity or design of the road improvements or impairment of the safety or performance of the circulation system, including transit, roadways, bicycle lanes or pedestrian paths;
- Conflict with an applicable congestion management program for designated roads or highways that would result in increased risk of harm to the public;
- Substantially increasing hazards due to a design feature or incompatible uses associated with construction-related traffic that would result in an increased risk of harm to the public;
- Inadequate emergency access that would result in an increased risk of harm to the public; and
- Conflict of construction-related activities with public transit, bicycle, or pedestrian facilities, or decrease of the performance or safety of such facilities resulting in an increased risk of harm to the public.

Noise

- Short-term exceedance of Siskiyou County General Plan criteria for maximum allowable noise levels from construction equipment;
- Short-term increases in daytime and nighttime noise levels affecting residents near Copco No.1 Dam due to construction activities;
- Short-term increases in nighttime noise levels affecting residents near Iron Gate Dam due to construction activities;
- Short-term increase in noise levels affecting residential areas near Copco No. 1 and Iron Gate reservoirs due to restoration activities;
- Short-term increase in vibration levels affecting residential areas near Copco No.1, Copco No. 2, and Iron Gate dams due to blasting activities during removal of the dams.

There are no significant and unavoidable impacts under the Proposed Project for the following resource areas: groundwater, water supply/water rights, greenhouse gas emissions, geology, soils, and mineral resources, paleontologic resources, land use and planning, agricultural and forestry resources, population and housing, and utilities and service systems.

Cumulative Impacts

CEQA requires determination of whether the combined impact of the Proposed Project and other projects causing related impacts is significant and adverse, and whether the incremental impact of the Proposed Project is cumulatively considerable. Using a list of past, present, and probable future projects within the Klamath Basin, the following impacts are assessed as “cumulatively considerable”:

Water Quality

- Short-term increases in suspended sediments under the Proposed Project in combination with the 2017 court-ordered flushing and emergency dilution flows; and
- Short-term water quality effects of the Proposed Project in combination with wildfires.

Air Quality

- Short-term increases in criteria air pollutant emissions under the Proposed Project in combination with forest and wildfire management projects.

Public Services

- Short-term public services effects from the Proposed Project in combination with non-project activities.

Hazards and Hazardous Substances

- Short-term and long-term hazards (fire-fighting water access) from the Proposed Project in combination with non-project activities.

Transportation and Traffic

- Short-term and long-term traffic and transportation effects from the Proposed Project in combination with non-project activities.

There are no cumulatively considerable impacts for other resource areas.

Alternatives to the Proposed Project

No Project Alternative

The No Project Alternative describes the environment should the KRRC's Proposed Project – to decommission the four dams and associated facilities – not proceed. There is significant uncertainty about the long-term disposition of the Lower Klamath Project facilities if the KRRC's Proposed Project does not proceed.

During the short term (i.e., 0–5 year period), the Lower Klamath Project (i.e., J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dams and associated facilities) and the remaining Klamath Hydroelectric Project facilities (East Side, West Side, Keno, and Fall Creek) would continue to operate under annual licenses issued by FERC until the disposition of Lower Klamath Project facilities could be determined through the FERC relicensing process. This would include the potential of another settlement agreement under that process. This timeframe also includes time for completion of any necessary planning or studies to undertake facilities modifications. The current annual license issued for Lower Klamath Project facilities under PacifiCorp's annual FERC licenses for the Klamath Hydroelectric Project (Project No. 2082) has no requirements for additional fish passage or implementation of the prescriptions that are currently before FERC in the Klamath Hydroelectric Project relicensing process.

Additionally, in the short term, the No Project Alternative would not result in any change from the existing management conditions, except regarding flow and certain interim water quality and habitat measures as noted in this paragraph. The 2017 court-ordered flushing and emergency dilution flow releases downstream of Iron Gate Dam (U.S. District Court 2017) would modify flow releases compared to the existing condition. Some KHSA Interim Measures (IMs) would cease.

In addition to the KHSA IMs, there are various efforts in the Klamath Basin to improve water quality, which are discussed in Cumulative Effects (Section 3.24). The effects of these efforts, including efforts aimed at meeting Klamath River total maximum daily loads (TMDLs) are not analyzed for the short term under No Project Alternative because the basin response to the restoration measures to meet the TMDLs during the short term is too speculative.

In the short term, the No Project Alternative would not meet the Proposed Project's underlying objectives. In the long term, the impacts and ability of the No Project Alternative to meet project objectives and purposes are speculative, but they would be within the range of the alternatives and the Proposed Project evaluated in this EIR.

Partial Removal Alternative

In the Partial Removal Alternative, portions of J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dams and associated facilities would be removed to ensure a free-flowing Klamath River and year-round volitional fish passage in the Hydroelectric Reach (under all river stages and flow conditions). Ancillary facilities associated with J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dam complexes that do not affect Klamath River flows or volitional fish passage would be secured for public safety (e.g., sealing or fencing to prevent entry, removal of hazardous materials) and abandoned in place. In general, the ancillary facilities to be retained under the Partial Removal Alternative include the Copco No. 1 Powerhouse, penstocks, and intake structure, the Copco No. 2 Powerhouse, steel penstocks and supports, and intake structure, and the lower portion of the Iron Gate Powerhouse, as well as the mechanical and electrical equipment associated with each powerhouse. All other aspects would occur as described under the Proposed Project: dam and powerhouse deconstruction, reservoir drawdown, erosion of reservoir sediment deposits during drawdown, restoration in the reservoir footprint, restoration of upland areas, hatchery operations, City of Yreka water supply pipeline relocation, aquatic and terrestrial resource measures, road and bridge improvements/replacements, culvert replacements, recreation facilities removal, traffic management, groundwater well monitoring and replacement, fire management, hazardous material management, emergency response, and noise and vibration control measures.

This alternative would meet the underlying purpose, and all the objectives, of the Proposed Project. Under the Partial Removal Alternative, the construction footprint would be slightly reduced, and the impact to the historical built environment would be reduced as compared with the Proposed Project. Should this alternative be pursued, the responsibility for long-term maintenance of remaining facilities is unknown.

Continued Operations with Fish Passage Alternative

In the Continued Operations with Fish Passage Alternative, the J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dams and associated facilities would be relicensed by FERC for continued operations with changes to allow for upstream and downstream fish passage and updated flow requirements consistent with fishway prescriptions. This alternative would include volitional year-round upstream and downstream fish passage at the dams, and an increase of minimum flows in the J.C. Boyle Bypass Reach and the Copco No. 2 Bypass Reach. Conditions would include flows required by the NMFS and USFWS 2013 Joint Biological Opinion for the Klamath Irrigation Project (2013 BiOp Flows), 2017 court-ordered flushing and emergency dilution flows, and design and implementation of a Reservoir Management Plan. KHSA Interim Measures (IMs) (KHSA Section 1.2.4) would not continue under the Continued Operations with Fish Passage Alternative. Actions consistent with IMs designed for water quality improvements are analyzed in this alternative as part of the Reservoir Management Plan. Additionally, the "California Klamath Restoration Fund/Coho Enhancement Fund" restoration actions, described under the No Project Alternative (see Table 4.2-1), would continue.

This alternative would not meet one of Proposed Project's objectives because it does not adequately address Project-related long-term water quality impairments. It also would only partially further the underlying purpose of the Proposed Project because it would not result in timely improvement of water quality related to the Proposed Project within

and downstream of the current Hydroelectric Reach; however, it would further the underlying purpose of providing fish passage upstream of Iron Gate Dam. Because the dams and reservoirs would remain, they would still continue as an impairment to migration that is not present under the Proposed Project. Compared to the Proposed Project, this alternative would avoid potential impacts associated with sediment release, dam removal, and riverine restoration. It would also continue hydropower production at close to existing levels, and it would reduce the level of construction and its associated impacts (as construction activities would mainly be associated with fish ladders rather than dam decommissioning). However, while this alternative would further the underlying purpose and related objectives of providing fish passage upstream of Iron Gate Dam, fish survival through fishways would be reduced as compared to through undammed stream reaches. Further, this alternative would not improve other water quality conditions that are stressors for fish and other resources. Thus, this alternative would further the underlying purpose and Proposed Project objectives to some extent, but not to the same extent as the Proposed Project.

Three Dam Removal Alternative

This alternative would remove the three California Lower Klamath Project dams (Copco No. 1, Copco No. 2, and Iron Gate) and associated facilities, but J.C. Boyle Dam and associated facilities would remain in place. J.C. Boyle Dam would operate under the conditions that federal agencies had imposed in the FERC proceedings for the continued relicensing of the Klamath Hydroelectric Project (which is currently on hold). The main changes to J.C. Boyle Dam facilities and operations would be: construction of new fish ladders for upstream and downstream fish passage; new fish screens; elimination of peaking operations; elimination of whitewater recreation flows; changed bypass release requirements; and any conditions imposed by the Oregon Department of Environmental Quality as part of its water quality certification³ of J.C. Boyle Dam and its associated facilities. The flow-related measures would reduce power generation at J.C. Boyle Dam relative to existing conditions. The alternative assumes that USBR's flow release requirements for Iron Gate Dam would continue to be required as federal Endangered Species Act requirements (i.e., 2013 BiOp Flows and 2017 court-ordered flushing and emergency dilution flows). This alternative considers conditions with and without the 2017 court-ordered flushing and emergency dilution flows for potential impacts related to fish disease.

As compared to the Proposed Project, retaining J.C. Boyle Dam would somewhat reduce the amount and duration of short-term sediment release during reservoir drawdown, although it would not change the determinations of significance or associated mitigation measures. Compared to the Proposed Project, retaining J.C. Boyle Dam results in no meaningful difference in the significance determinations or associated mitigation measures related to construction impacts, because the differing construction efforts would occur in Oregon and any impacts would be substantially diluted in California. This alternative would allow some level of non-peaking hydropower production to continue, but it would be less than under the existing condition or the Continued Operation with Fish Passage Alternative. However, while this alternative would further the underlying purpose and related objectives of providing fish passage, fish survival through fishways would be reduced as compared to passage through un-

³ This alternative does not make any assumptions about potential Oregon water quality certification conditions.

dammed stream reaches. Thus, the Three Dam Removal Alternative would further the underlying purpose and Proposed Project objectives, but not to the same extent as the Proposed Project.

Two Dam Removal Alternative

This alternative would remove the Copco No. 1 and Iron Gate dams and associated facilities in California, while the J.C. Boyle Dam in Oregon and the Copco No. 2 Dam in California would remain in place. J.C. Boyle Dam would operate under the conditions that federal agencies had imposed in the FERC proceedings for the continued relicensing of the Klamath Hydroelectric Project (which is currently on hold). The main changes to J.C. Boyle facilities and operations would be: construction of new fish ladders for upstream and downstream fish passage; new fish screens; elimination of peaking operations; elimination of whitewater recreation flows; changed bypass release requirements; and any conditions imposed by the Oregon Department of Environmental Quality as part of its water quality certification⁴ of J.C. Boyle Dam and its associated facilities. The main changes to Copco No. 2 would be: an increase of minimum flows for the Bypass Reach; installation of upstream and downstream fish passage facilities; and any conditions imposed by the State Water Board as part of its water quality certification of Copco No. 2 and its associated facilities⁴. Flow-related requirements would reduce power generation at J.C. Boyle Dam relative to existing conditions.

This alternative assumes that USBR's flow requirements would be the same as those required under the current federal Endangered Species Act requirements (i.e., 2013 BiOp Flows and 2017 court-ordered flushing and emergency dilution flows) and considers conditions with and without the 2017 court-ordered flushing and emergency dilution flows for potential impacts related to fish disease.

Retaining J.C. Boyle and Copco No. 2 dams would reduce the amount and duration of short-term sediment release and it would reduce construction and waste disposal in California, thus reducing the associated significant impacts compared to the Proposed Project. This alternative would also allow some non-peaking hydropower production to continue – less than under the existing condition or Continued Operation with Fish Passage Alternative, but more than under the Three Dam Removal Alternative. However, while this alternative would further the underlying purpose and related objectives of providing fish passage, fish survival through fishways would be reduced as compared to passage through un-dammed stream reaches. Thus, the Two Dam Removal Alternative would further the underlying purpose and Proposed Project objectives, but not to the same extent as the Proposed Project.

⁴ This alternative does not make any assumptions about potential Oregon and California water quality certification conditions.

No Hatchery Alternative

The No Hatchery Alternative is the same as the Proposed Project, except that modification and operation of Fall Creek Hatchery would not occur, and the Iron Gate Hatchery operations would end upon dam removal instead of continuing with reduced production for eight years following removal of the dams, as under the Proposed Project. Under this alternative, all production of salmonids would be discontinued after hatchery releases occur in the fall of dam removal year 1 and the reduced production goals for the Proposed Project would not occur. Construction activities would include all those identified under the Proposed Project, except that: Iron Gate Hatchery facilities would be completely removed; and, Fall Creek Hatchery would not be refurbished and would not reopen. Water diversions to operate the hatcheries would not be needed. This alternative would reduce construction-related impacts associated with the reopening of Fall Creek Hatchery, modifications to provide water, and installation of a new fish ladder at Iron Gate Hatchery.

The No Hatchery Alternative would further the underlying purpose and objectives, although the alternative would not meet Objective 2 (to advance the long-term restoration of the natural fish population in the Klamath Basin, with particular emphasis on restoring the salmonid fisheries used for subsistence, commerce, tribal cultural purposes, and recreation) as quickly as under the Proposed Project.

Public Involvement and Agency Consultation

The State Water Board solicited public and agency input for the Lower Klamath Project and Alternatives, in accordance with CEQA Guidelines Section 15082. The *Notice of Preparation and Scoping Meetings for an Environmental Impact Report for the Lower Klamath Project License Surrender (NOP)* was issued for a 42-day public comment period (December 22, 2016 to February 1, 2017). The State Water Board held three public scoping meetings (in Arcata, Sacramento, and Yreka) in January 2017 to solicit input (see the *Scoping Report* attached as Appendix A). A total of 1,418 oral and written comments were received. Seven comment emails or letters were received after the close of the comment period and were included in the *Scoping Report*.

In addition to the formal scoping process, the State Water Board has consulted with and/or obtained comments from various Native American Tribes, state and federal public agencies, affected local agencies, and stakeholders, including, but not limited to:

- CALFIRE
- California Coastal Commission
- California Department of Fish and Wildlife (CDFW) Region 1 (includes participation in KRRC Technical Workgroup Inter-agency Meetings)
- California Natural Resources Agency
- National Marine Fisheries Service (includes participation in KRRC Technical Workgroup Inter-agency Meetings)
- Native American Tribes – Shasta Nation, Shasta Indian Nation, Yurok Tribe, Karuk and Hoopa Valley Tribes
- Oregon Department of Environmental Quality
- Siskiyou County

- United States Bureau of Reclamation (USBR)
- United States Fish and Wildlife Service (USFWS) (includes participation in KRRRC Technical Workgroup Inter-agency Meetings)
- United States Geological Survey

Areas of Controversy

CEQA Guidelines Section 15123 requires disclosure of the controversial project issues known to the Lead Agency, including those raised by agencies and the public. Table ES-2 highlights controversies raised by agencies and the public during the scoping period and other forums. Additional information concerning these areas of controversy and others can be found in the Scoping Report (Appendix A of this EIR). Opinions and issues raised by agencies and members of the public do not necessarily represent the position of the State Water Board.

Table ES-2. Areas of Controversy and Issues Raised by Agencies and the Public.

Topic	Issue Raised and Area of Controversy	EIR Section(s), If Applicable
Geographic Scope of EIR	The geographic scope of the EIR's area of analysis.	Sections 1.1 through 1.4, as well as individual areas of analysis in each Section 3 resource area
Range of Alternatives of EIR	Concern that alternatives besides the Proposed Project be addressed, including a dams-in alternative	Section 4
Fisheries and Aquatic Resources	The potential for the Proposed Project to improve fisheries in the Klamath Basin, and the range of historic fisheries.	Section 3.3.2.1
	Concern that sediment release during dam removal will have significant and deleterious effects on the aquatic environment from Iron Gate Dam to the Pacific Ocean during the period of dam removal.	Sections 3.3.5.1 and Appendix E
	Loss of sucker habitat in reservoirs	Sections 3.3.2.1 and Potential Impact 3.3-13
Water Quality	The short- and long-term water quality impacts associated with the Proposed Project. Water quality related concerns include the amount, toxicity, and fate and transport of sediment behind the dams; duration of short-term impacts; and the consequences of conversion of the system from reservoirs to riverine.	Section 3.2
Water for Agriculture, Fire Suppression, and Environmental Uses	Concern that removal of the Project dams will adversely impact irrigation in the Scott and Shasta river basins.	Section 3.8.2.2
	Reservoirs serve as a water source for fighting regional wildland fires. Potential for reduced water sources for fire suppression efforts with loss of the reservoirs.	Section 3.17.5, Potential Impact 3.17-3 Sections 3.21.5, Potential Impact 3.21-8
	Concern regarding loss of water provided from the reservoirs for additional summer instream flows.	Section 3.3.5.5
	Concern regarding loss of agricultural irrigation supply to farmers in the upper basin areas of California and Oregon.	Section 3.8.2.1 and Section 3.8.5, Potential Impact 3.8-2
	Concern regarding changes in groundwater table and associated water supply with loss of the reservoirs.	Section 3.7.5
Flood Hydrology	Concern regarding changes to flow regulation and flood control.	Section 3.6.2.3 and Section 3.6.5, Potential Impact 3.6-1, 3.6-3, and 3.6-4
Loss of Renewable Power Supply	Concern that loss of the Project will result in the loss of renewable power.	Section 3.10.2, Potential Impacts 3.10-1 and 3.10-2

Topic	Issue Raised and Area of Controversy	EIR Section(s), If Applicable
Regional Economic Impacts	Concern regarding lost power generation and impacts to local real estate.	Section 5.4
	Concern regarding ongoing impacts to commercial fisheries due to negative effects of dams on habitat quantity and quality	Section 5.4
Upper Klamath Basin	Analysis needs to include consideration of the Oregon dams and the Upper Klamath Basin Irrigation Project.	Throughout, particularly Sections 3.2, 3.3, 3.8, and 3.24
Loss of Reservoir Environment	Dam removal would result in a loss of reservoirs, affecting individuals that live on or near the reservoirs and who value the reservoirs' aesthetic and recreational values.	Section 3.19.2 and Section 3.19.5, Potential Impacts 3.19-1, 3.19-4, 3.19-5 Section 3.20.2.3 and Section 3.20.5, Potential Impact 3.20-2
Environmental Law Compliance	Concern that dam removal is premature and/or a pre-determined outcome.	Sections 1.1 through 1.5 and all impact analyses considered in Sections 3 and 4
Changes in Recreational Uses, including Types and Amounts of Whitewater Boating	Peaking flows from operation of the hydroelectric project currently allow for commercial whitewater boating in mid- to late-summer. Concern regarding loss of whitewater boating flows.	Section 3.20.2.2 and Section 3.20.5, Potential Impact 3.20-5
Siskiyou County Advisory Election Vote November 2, 2010 (Measure G).	The Siskiyou County ballot asked, "Should the Klamath River Dams (Iron Gate, Copco 1, and Copco 2) and associated hydroelectric facilities be removed – Yes or No?" 78.84 percent of voters expressing an opinion voted No to dam removal, while 21.86 percent voted Yes.	While this is not an environmental impact the State Water Board acknowledges vote in Section 2.6.1
Traffic and Road Conditions	Concern that there may be construction-related impacts to local traffic and road conditions, and effects on emergency response times.	Section 3.22

Please refer to the Scoping Report (Appendix A of this EIR) for further information on issues identified by agencies and the public during the public scoping process. The Scoping Report can also be found online at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/lower_klamath_ferc14803/scoping_report.pdf. Scoping Report appendices are available separately on the Lower Klamath Project webpage. The State Water Board's Proposed Project webpage has other pertinent descriptions and links to documents and is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/lower_klamath_ferc14803.shtml.

Issues to be Resolved

CEQA Guidelines Section 15123 requires disclosure of issues to be resolved.

It is clear that the Klamath River has significantly degraded water quality and aquatic resources, and that these ongoing impacts stem from multiple factors including operation of the hydroelectric facilities. It is also clear that removal of the Lower Klamath Project dams and associated facilities under the Proposed Project is a large undertaking that would itself involve negative as well as positive environmental consequences, particularly in the short term. The degree of environmental impacts and benefits for the proposed restoration project are issues to be resolved, as is the potential for mitigation of impacts both within and outside of the State Water Board's purview.

Based solely on a comparison to the existing condition (summarized in Table ES-1), the alternative with the least number of unmitigable adverse environmental impacts would be the Continued Operations with Fish Passage Alternative. However, the Proposed Project is a restoration project aimed at improving the aquatic ecosystem in the Klamath River over the long term. Therefore, in identifying the environmentally superior alternative in this context, it makes sense to evaluate the degree of benefit that the alternatives provide above the current degraded condition, as well as the duration and severity of negative impacts. Based on the potential impacts and effects identified in this EIR (summarized in Table ES-1), the Proposed Project would result in significantly more identified benefits for environmental resources than the Continued Operations with Fish Passage Alternative, including all of the benefits listed above under *Effects Found to be Beneficial*. Further, the majority of the unmitigable adverse impacts identified under the Proposed Project would occur in the short term, during reservoir drawdown and construction activities associated with hydroelectric facilities removal. In looking at the range of benefits and impacts the State Water Board has identified the Proposed Project as the environmentally superior alternative.

The KRRC proposes to further develop Proposed Project actions relating to certain state and local regulatory requirements for several resource areas that fall outside of State Water Board's water quality certification authority. The State Water Board anticipates implementation of additional measures (e.g., good neighbor agreements between the KRRC and relevant state or local agencies, recommended measures in this EIR, and any modifications developed through the FERC process that provide the same or better level of protection for the resource in question) would reduce impacts. The EIR notes where such protection would eliminate the potential for a significant impact. However, the State Water Board cannot ensure implementation of good neighbor agreements, recommended measures included in this EIR, or modifications anticipated to be developed through the FERC process. Therefore, the State Water Board has identified impacts that rely on implementation of such agreements or recommended measures in this EIR as significant and unavoidable.

References

FERC (Federal Energy Regulatory Commission). 2007. Final Environmental Impact Statement for Hydropower License, Klamath Hydroelectric Project, FERC Project No. 2082-027, FERC/EIS-0201F. Washington, D.C., Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Licensing. <https://www.ferc.gov/industries/hydropower/enviro/eis/2007/11-16-07.asp>

NMFS and USFWS (National Marine Fisheries Service and U. S. Fish and Wildlife Service). 2013. Biological opinions on the effects of proposed Klamath Project operations from May 31, 2013, through March 31, 2023, on five federally listed threatened and endangered species. Prepared by NMFS, Southwest Region, Northern California Office; and USFWS, Pacific Southwest Region, Klamath Falls Fish and Wildlife Office.

State Water Board (State Water Resources Control Board). 2017. Scoping Report for Lower Klamath Project License Surrender Environmental Impact Report. Prepared by State Water Board, Sacramento, California.

Stillwater Sciences. 2010. Anticipated sediment release from Klamath River dam removal within the context of basin sediment delivery. Final Report. Prepared by Stillwater Sciences, Berkeley, California for State Coastal Conservancy, Oakland, California.

USBR (U.S. Bureau of Reclamation). 2012. Hydrology, Hydraulics and Sediment Transport Studies for the Secretary's Determination on Klamath River Dam Removal and Basin Restoration, Technical Report No. SRH-2011-02. Prepared for Mid-Pacific Region, Bureau of Reclamation, Technical Service Center, Denver, Colorado. Available from: <http://klamathrestoration.gov/keep-me-informed/secretarial-determination/role-of-science/secretarial-determination-studies>.

U.S. District Court. 2017. Hoopa Valley Tribe v. U.S. Bureau of Reclamation et al. and Klamath Water Users Association et al. Case No. 3:16-cv-04294-WHO. Order modifying February 8, 2017 injunction. U.S. District Court for the Northern District of California, San Francisco Division.

USFWS (U.S. Fish and Wildlife Service). 2007. The Department of the Interior's filing of modified terms, conditions, and prescriptions (Klamath Hydroelectric Project, No. 2082). Prepared by USFWS, Sacramento, California for Federal Energy Regulatory Commission, Washington, D.C.

USFWS and NMFS (National Marine Fisheries Service). 2007. United States Department of the Interior and National Marine Fisheries Service modified prescriptions for fishways and alternatives analysis pursuant to Section 18 and Section 33 of the Federal Power Act for the Klamath Hydroelectric Project (FERC Project No. 2082).

Table ES-1. Summary of Impacts and Mitigation Measures.

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Water Quality								
Potential Impact 3.2-1. Short-term and long-term alterations in water temperatures due to conversion of the reservoir areas to a free-flowing river.								
Hydroelectric Reach to the confluence with the Salmon River	S	L	PP, PR, 2R, 3R, NH					
Middle Klamath River downstream from the Salmon River, Lower Klamath River, Klamath River Estuary, Pacific Ocean nearshore environment	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.2-2. Short-term and long-term alterations in seasonal water temperatures in the Klamath River Estuary due to morphological changes induced by dam removal sediment release and subsequent deposition in the estuary.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.2-3. Increases in suspended sediments due to release of sediments currently trapped behind the dams.								
	S			NP, CO			PP, PR, 2R, 3R, NH	
		L		PP, PR, CO, 2R, 3R, NH				
Potential Impact 3.2-4. Increases in suspended material from stormwater runoff due to pre-construction, dam deconstruction and removal, and restoration activities in the Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam.								
	S				WQ-1, TER-1, HZ-1	PP, PR, 2R, 3R, NH		
Potential Impact 3.2-5. Long-term alterations in mineral (inorganic) suspended material from the lack of continued interception and retention by the dams.								
		L		PP, PR, 2R, 3R, NH				

Potential Impacts							
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.2-6. Long-term alterations in algal-derived (organic) suspended material from the lack of continued interception and retention by the dams.							
	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.2-7. Short-term increases in sediment-associated nutrients due to release of sediments currently trapped behind the dams.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.2-8. Long-term alterations in nutrients from the lack of interception and retention by the dams and conversion of the reservoir areas to a free-flowing river.							
Annual interception and retention of total nutrients	L		PP, PR, 2R, 3R, NH				
Potential seasonal release of dissolved nutrients	L	PP, PR, 2R, 3R, NH					
Potential Impact 3.2-9. Short-term increases in oxygen demand and reductions in dissolved oxygen due to release of sediments currently trapped behind the dams.							
Hydroelectric Reach and Middle Klamath River from Iron Gate Dam to the Salmon River	S		NP, CO			PP, PR, 2R, 3R, NH	
Middle Klamath River downstream from the Salmon River, Lower Klamath River, Klamath River Estuary	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.2-10. Long-term alterations in dissolved oxygen concentrations and daily variability due to conversion of the reservoir areas to a free-flowing river.							
Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam (daily fluctuations)	L		PP, PR, 2R, 3R, NH				
Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam (elimination of summer and fall extremes)	L	PP, PR, 2R, 3R, NH					
Hydroelectric Reach and Middle Klamath River (winter and spring)	L		PP, PR, 2R, 3R, NH				
Lower Klamath River, Klamath River Estuary, and Pacific Ocean nearshore environment	L		PP, PR, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.2-11. Alterations in pH and daily pH fluctuations due to a conversion of the reservoir areas to a free-flowing river.								
Hydroelectric Reach at Oregon-California state line	S	L		PP, PR, 2R, 3R, NH				
Hydroelectric Reach from Copco No. 1 Reservoir to Iron Gate Dam	S	L	PP, PR, 2R, 3R, NH					
Middle Klamath River, Klamath River Estuary, Pacific Ocean nearshore environment	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.2-12. Alterations in chlorophyll-a and algal toxins due to a conversion of the reservoir areas to a free-flowing river.								
	S	L	PP, PR, 2R, 3R, NH					
Potential Impact 3.2-13. Human exposure to inorganic and organic contaminants due to release and exposure of reservoir sediment deposits.								
	S	L			WQ-2, WQ-3	PP, PR, 2R, 3R, NH		
Potential Impact 3.2-14. Freshwater aquatic species exposure to inorganic and organic contaminants due to release of sediments currently trapped behind the dams.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.2-15. Short-term increases in inorganic and organic contaminants from hazardous materials associated with construction and restoration activities in the Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam.								
	S				WQ-1, TER-1, HZ-1	PP, PR, 2R, 3R, NH		
Potential Impact 3.2-16. Short-term impacts to aquatic biota from herbicide application during restoration of the reservoir areas.								
	S				WQ-4	PP, PR, 2R, 3R, NH		

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.2-17. Short-term and long-term influence of changes in Iron Gate and Fall Creek hatchery production on Klamath River and Fall Creek water quality.								
Water quality in the Middle Klamath River downstream of Iron Gate Hatchery	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Water temperature and dissolved oxygen in Fall Creek downstream of Fall Creek Hatchery	S			NP, CO, NH			PP, PR, 2R, 3R	
Water quality (except water temperature and dissolved oxygen) in Fall Creek downstream of Fall Creek Hatchery		L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.2-18. Short-term impacts on water quality from construction activities on Parcel B lands.								
	S	L			WQ-1, TER-1, HZ-1	PP, PR		
Potential Impact 4.2.2-1 Seasonal alterations in water temperature due to continued impoundment of water in the reservoirs.								
J.C. Boyle Peaking Reach from the Oregon-California state line to Copco No. 1 Reservoir	S	L	CO	NP (S only)				
Hydroelectric Reach from Copco No. 1 Reservoir to Iron Gate Dam and the Middle Klamath River to the confluence with the Salmon River	S	L		NP (S only), CO				
Middle Klamath River downstream of the confluence with the Salmon River, the Lower Klamath River, and the Klamath River Estuary, and the Pacific Ocean nearshore environment	S	L		NP (S only), CO				
Potential Impact 4.2.2-2. Seasonal increases in algal-derived (organic) suspended material due to continued impoundment of water in the reservoirs.								
Hydroelectric Reach from J.C. Boyle Reservoir to the upstream end of Copco No. 1 Reservoir	S	L		NP (S only), CO				
Hydroelectric Reach from Copco No. 1 Reservoir to Iron Gate Dam, the Middle and Lower Klamath River, and the Klamath River Estuary	S	L		NP (S only), CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 4.2.2-3 Increases in suspended material due to implementation of 2017 court-ordered flushing and emergency dilution flows downstream of Iron Gate Dam.								
	S	L		NP (S only), CO				
Potential Impact 4.4.2-1. Short-term increases in suspended material and contaminants from stormwater runoff due to construction activities associated with replacement and construction of new fish passage facilities.								
Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam	S			CO	WQ-1, TER-1, HZ-1			
Potential Impact 4.2.2-4. Annual interception and retention of nutrients and seasonal release of nutrients due to continued impoundment of water in the reservoirs.								
Hydroelectric Reach and Middle Klamath River (annual interception and retention of nutrients)	S	L		NP (S only), CO				
Hydroelectric Reach and the Middle Klamath River (seasonal release of nutrients)	S	L		NP (S only), CO				
Potential Impact 4.2.2-5. Seasonal low dissolved oxygen concentrations due to continued impoundment of water in the reservoirs.								
Hydroelectric Reach and the Middle Klamath River	S	L		NP (S only), CO				
Middle Klamath River downstream of Seiad Valley, the Lower Klamath River, and the Klamath River Estuary	S	L		NP (S only), CO				
Potential Impact 4.2.2-6. Seasonal high pH and daily pH fluctuations due to continued impoundment of water in the reservoirs.								
Hydroelectric Reach and the Middle Klamath River	S	L		NP (S only), CO				
Middle Klamath River downstream of Seiad Valley the Lower Klamath River, and the Klamath River Estuary	S	L		NP (S only), CO				
Potential Impact 4.2.2-7. Seasonal increases in chlorophyll-a and algal toxins due to continued impoundment of water in the reservoirs.								
Hydroelectric Reach from J.C. Boyle Reservoir to upstream end of Copco No. 1 Reservoir	S	L		NP (S only), CO				
Hydroelectric Reach from Copco No. 1 Reservoir to Iron Gate Dam, the Middle and Lower Klamath River, and the Klamath River Estuary	S	L		NP (S only), CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 4.2.2-8. Human and freshwater aquatic species' exposure to inorganic and organic contaminants due to continued impoundment of water in the reservoirs.								
	S	L		NP (S only), CO				
Aquatic Resources								
Potential Impact 3.3-1. Effects on coho salmon critical habitat quality and quantity due to short-term sediment releases and long-term changes in habitat quality and quantity due to dam removal.								
	S				AQR-1 and AQR-2	PP, PR, 2R, 3R, NH		
		L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-2. Effects on southern resident killer whale critical habitat quality due to short-term and long-term alterations to salmon populations due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-3. Effects on eulachon critical habitat quality due to short-term sediment releases due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-4. Effects on Chinook and coho salmon Essential Fish Habitat (EFH) quality and quantity due to short-term sediment releases and long-term changes in habitat quality and quantity due to dam removal.								
	S				AQR-1 and AQR-2	PP, PR, 2R, 3R, NH		
		L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-5. Effects on groundfish Essential Fish Habitat (EFH) quality due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-6. Effects on pelagic fish Essential Fish Habitat (EFH) quality due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.3-7. Effects on the fall-run Chinook salmon population due to short-term sediment releases and long-term changes in habitat quality, habitat quantity, and hatchery operations due to dam removal.							
	S		PP, PR, 2R, 3R, NH				
	L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-8 Effects on the spring-run Chinook salmon population due to short-term sediment releases and long-term changes in habitat quality, habitat quantity, and hatchery operations due to dam removal.							
	S		PP, PR, 2R, 3R, NH				
	L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-9. Effects on coho salmon populations due to short-term sediment releases and long-term changes in habitat quality, habitat quantity, and hatchery operations due to dam removal.							
	S		PP, PR, 2R, 3R, NH				
	L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-10. Effects on the steelhead population due to short-term sediment releases and long-term changes in habitat quality, habitat quantity, and hatchery operations due to dam removal.							
	S		PP, PR, 2R, 3R, NH				
	L	PP, PR, 2R, 3R, NH					

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.3-11. Effects on the Pacific lamprey population due to short-term sediment releases and long-term changes in habitat quality and quantity due to dam removal.								
	S			PP, PR, 2R, 3R, NH				
		L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-12. Effects on the green sturgeon population due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-13. Effects on Lost River and shortnose sucker populations due to short- and long-term changes in habitat quality and quantity due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-14. Effects on the redband trout population due to short-term sediment releases and long-term changes in habitat quality and quantity due to dam removal.								
	S			PP, PR, 2R, 3R, NH				
		L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-15. Effects on the eulachon population due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-16. Effects on the longfin smelt population due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				

Potential Impacts								
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.3-17. Effects on species interactions between introduced resident fish species and native aquatic species due to short- and long-term changes in habitat quality and quantity due to dam removal.								
	S	L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-18. Effects on aquatic species from interactions among fish species due to short- and long-term changes in habitat quantity due to dam removal.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-19. Effects on freshwater mollusks populations due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
<i>M. falcata</i> , <i>G. angulata</i> , and freshwater clams	S	L		PP, PR, 2R, 3R, NH				
<i>Anodonta spp.</i>	S	L		2R, 3R			PP, PR, NH	
Potential Impact 3.3-20. Effects on fish species from alterations to benthic macroinvertebrates due to short-term sediment releases and long-term changes in habitat quality due to dam removal.								
	S			PP, PR, 2R, 3R, NH				
		L	PP, PR, 2R, 3R, NH					
Potential Impact 3.3-21. Effects on aquatic resources due to short-term noise disturbance and water quality alterations from construction and deconstruction activities.								
	S	L		PP, PR, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.3-22. Effects on aquatic species due to short-term noise disturbance and water quality alterations from deconstruction activities and long-term fish screen upgrades from the relocation of the City of Yreka Water Supply Pipeline.								
	S	L		PP, PR, 2R, 3R, NH				
Potential Impact 3.3-23. Effects on anadromous salmonid populations due to short-term and long-term Bogus Creek flow diversions for the Iron Gate Hatchery.								
	S			NP, CO, NH	AQR-3	PP, PR, 2R, 3R		
		L			AQR-3	PP, PR, 2R, 3R		
Potential Impact 3.3-24. Effects on anadromous salmonid populations due to short-term and long-term Fall Creek flow diversions for the Fall Creek Hatchery.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 4.2.3-1 Effects on coho salmon critical habitat quality and quantity due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-2 Effects on southern resident killer whale critical habitat quality due to alterations to salmon populations due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 4.2.3-3. Effects on eulachon critical habitat quality due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-4. Effects on Chinook and coho salmon Essential Fish Habitat (EFH) quality due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-5. Effects on groundfish Essential Fish Habitat (EFH) quality due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-6. Effects on pelagic fish Essential Fish Habitat (EFH) quality due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-7. Effects on the fall-run Chinook salmon population due to continued operations of the Lower Klamath Project.								
	S			NP, CO				
		L	CO					
Potential Impact 4.2.3-8. Effects on the spring-run Chinook salmon population due to continued operations of the Lower Klamath Project.								
	S			NP, CO				
		L	CO					
Potential Impact 4.2.3-9. Effects on coho salmon populations due to continued operations of the Lower Klamath Project.								
	S			NP, CO				
		L	CO					

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 4.2.3-10. Effects on the steelhead population due to continued operations of the Lower Klamath Project.								
	S			NP, CO				
		L	CO					
Potential Impact 4.2.3-11. Effects on the Pacific lamprey population due to continued operations of the Lower Klamath Project.								
	S			NP, CO				
		L	CO					
Potential Impact 4.2.3-12. Effects on the green sturgeon population due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-13. Effects on Lost River and shortnose sucker populations due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-14. Effects on the redband trout population due to continued operations of the Lower Klamath Project.								
	S			NP, CO				
		L	CO					
Potential Impact 4.2.3-15. Effects on the eulachon population due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-16. Effects on the longfin smelt population due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 4.2.3-17. Effects on species interactions between introduced resident fish species and native aquatic species due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-18. Effects on aquatic species from interactions among fish species due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-19. Effects on freshwater mollusks populations due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-20. Effects on fish species from alterations to benthic macroinvertebrates due to continued operations of the Lower Klamath Project.								
	S	L		NP (S only), CO				
Potential Impact 4.2.3-21. Alterations to aquatic habitat from implementation of California Klamath Restoration Fund/Coho Enhancement (IM2).								
Coho salmon, fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, freshwater mussels, and benthic macroinvertebrates	S	L	NP (S only), CO					
Redband trout, shortnose and Lost River suckers, green sturgeon, eulachon, and southern resident killer whales	S	L		NP (S only), CO				
Potential Impact 4.4.3-1 Effects on aquatic resources due to short-term noise disturbance and water quality alterations from fishway construction activities.								
	S				WQ-1, HZ-1	CO		

Potential Impacts							
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Phytoplankton and Periphyton							
Potential Impact 3.4-1 Short-term increase in growth of nuisance and/or noxious phytoplankton blooms due to increases in sediment-associated nutrients from release of sediments currently trapped behind the Lower Klamath Project dams.							
	S		PP, NP, PR, CO 2R, 3R, NH				
Potential Impact 3.4-2 Alterations in the spatial extent, temporal duration, transport, or concentration of nuisance and/or noxious phytoplankton blooms and concentrations of algal toxins due to dam removal and elimination of reservoir habitat.							
Hydroelectric Reach through the Klamath River Estuary	S	L	PP, PR, 2R, 3R, NH				
Pacific Ocean nearshore environment	S	L		PP, PR, 2R, 3R, NH			
Potential Impact 3.4-3. Short-term increase in growth of nuisance periphyton species due to increases in sediment-associated nutrients from release of sediments currently trapped behind the Lower Klamath Project dams.							
	S		PP, NP, PR, CO 2R, 3R, NH				
Potential Impact 3.4-4. Alterations in the growth of nuisance periphyton species in the Hydroelectric Reach due to increased nutrients and available low-gradient channel margin habitat formed by conversion of the reservoir areas to a free-flowing river and the elimination of hydropower peaking operations.							
Hydroelectric Reach from the Oregon-California state line to Copco No. 1 Reservoir	S	L				PP, PR, 2R, 3R, NH	
Hydroelectric Reach from Copco No. 1 Reservoir to Iron Gate Dam	S	L		PP, PR, 2R, 3R, NH			

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.4-5. Alterations in biomass of nuisance periphyton species due to increased nutrients from upstream dam removal and conversion of the reservoir areas to a free-flowing river.								
Middle and Lower Klamath River and the Klamath River Estuary		L		PP, PR, 2R, 3R, NH				
Potential Impact 4.2.4-1 Variations in nuisance periphyton species abundance downstream of Iron Gate Dam due to implementation of 2017 court-ordered flushing and emergency dilution flows.								
Middle Klamath River from Iron Gate Dam to the Shasta River	S		NP					
Middle Klamath River downstream of the confluence with the Salmon River and the Lower Klamath River	S			NP				
Potential Impact 4.4.4-1 Long-term occurrence of nuisance and/or noxious phytoplankton blooms in the reservoirs.								
Hydroelectric Reach, Middle and Lower Klamath River, and the Klamath River Estuary		L		CO				
Potential Impact 4.4.4-2 Long-term colonization of nuisance periphyton in riverine reaches.								
Hydroelectric Reach		L		CO				
Middle Klamath River from Iron Gate Dam to the Shasta River		L	CO					
Middle Klamath River downstream of the confluence with the Salmon River and the Lower Klamath River		L		CO				

Potential Impacts								
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Terrestrial Resources								
Potential Impact 3.5-1 Construction-related impacts on wetland and riparian vegetation communities.								
	S			NP	TER-1	PP, PR, 2R, 3R, NH		
	S				TER-1 and TER-5	CO		
Potential Impact 3.5-2 Short-term and long-term impacts on wetland and riparian vegetation communities along existing reservoir shorelines due to reservoir drawdown.								
	S	L		PP, NP (S only) PR, CO, 2R, 3R NH				
Potential Impact 3.5-3. Short-term and long-term impacts on wetland habitat downstream of the Lower Klamath Project dams due to erosion or sediment deposition.								
	S	L		PP, NP (S only) PR, CO, 2R, 3R NH				
Potential Impact 3.5-4. Effects on riparian habitat downstream of the Lower Klamath Project dams due to short-term and long-term erosion or sediment deposition.								
	S			PP, PR, 2R, 3R, NP, CO, NH				
		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 3.5-5. Short-term and long-term impacts on native vegetation due to increased invasive plant species establishment.								
	S	L		NP (S only)		PP, PR, 2R, 3R, NH		

Potential Impacts								
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.5-6. Short-term and long-term impacts on culturally significant species in riparian and wetland habitats.								
	S			NP	TER-1	PP, PR, 2R, 3R, NH, CO		
		L		PP, PR, 2R, 3R, NH, CO				
Potential Impact 3.5-7. Short-term impacts on special-status plants and rare natural communities from construction-related activities. *								
Rare natural communities	S			PP, NP, PR, CO, 2R, 3R, NH				
Special-status	S			NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.5-8. Short-term and long-term impacts on special-status plants from reservoir removal. *								
	S	L		NP (S only), CO			PP, PR, 2R, 3R, NH	
Potential Impact 3.5-9. Short-term impacts on special-status terrestrial invertebrates from construction-related activities.								
	S			PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.5-10. Short-term impacts on special-status amphibian, reptiles, and mammals from construction activities. *								
Amphibians and reptiles	S			NP	TER-2 and TER-3	PP, PR, CO, 2R, 3R, NH		
Mammals	S			NP			PP, PR, CO, 2R, 3R, NH	

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.5-11. Short-term impacts on nesting birds from construction-related noise and habitat alterations. *								
	S			NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.5-12. Effects on willow flycatcher from short-term construction-related noise and short-term and long-term habitat alterations. *								
	S			NP			PP, PR, CO, 2R, 3R, NH	
Riparian habitat in the former location of Copco No. 1 and Iron Gate reservoirs		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 3.5-13. Short-term impacts on bald and golden eagles from construction-related noise and habitat alterations. *								
	S			NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.5-14. Short-term and long-term impacts on bats from construction noise and loss of roosting habitat. *								
	S	L		NP (S only)			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.5-15. Short-term and long-term impacts on northern spotted owl and critical habitat from construction-related noise and habitat alterations.								
	S	L		PP, NP (S only) PR, CO, 2R, 3R, NH				

Potential Impacts							
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.5-16. Effects on special-status amphibians and reptiles in riverine habitats from short-term high suspended sediment concentrations and flows and long-term changes in water quality.							
Pacific tailed frog, southern torrent salamander, northern red-legged frog, and western pond turtle	S		PP, NP, PR, CO, 2R, 3R, NH				
Foothill yellow-legged frog egg masses, if present	S		CO, NP			PP, PR, 2R, 3R, NH	
All special-status amphibians and reptiles		L	PP, PR, 2R, 3R, NH	CO			
Potential Impact 3.5-17. Effects on benthic macroinvertebrates from short-term dewatering and sedimentation and long-term alterations to habitat.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
		L	PP, PR, 2R, 3R, NH	CO			
Potential Impact 3.5-18. Short-term impacts on amphibian and reptile in riverine habitats from sedimentation.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.5-19. Impacts on native amphibians from loss of reservoir habitat.							
	S	L	PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.5-20. Short-term and long-term impacts on western pond turtle and amphibians from reduced BMI populations.							
	S	L	PP, NP (S only), PR, CO, 2R, 3R, NH				

Potential Impacts								
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.5-21. Short-term and long-term impacts on birds and bats from loss of aquatic reservoir and shoreline vegetative habitat.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.5-22. Short-term and long-term impacts on western pond turtle from loss of aquatic habitat.								
	S	L		NP (S only), CO	TER-4	PP, PR, 2R, 3R, NH		
Potential Impact 3.5-23. Long-term effects on deer from alterations to winter range habitat.								
		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 3.5-24. Effects on terrestrial species from herbicide use during reservoir restoration activities.								
Special-status plants and wildlife	S			PP, NP, PR, CO, 2R, 3R, NH				
Rare natural communities, wetlands, and riparian vegetation		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 3.5-25. Effects on wildlife from increased habitat for salmonids and changes in hatchery production.								
	S	L	PP, PR, 2R, 3R, NH	NP (S only), NH, CO				

Potential Impacts							
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.5-26. Impacts on special-status wildlife from Bogus Creek flow diversions.							
	S		NP, NH, CO	AQR-3	PP, PR, 2R, 3R		
Potential Impact 3.5-27. Impacts on special-status wildlife from Fall Creek flow diversions.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.5-28. Impacts on sensitive habitats and special-status terrestrial wildlife and plant species from construction activities on Parcel B lands. *							
		L		WQ-1, TER- 1, and TER-4			PP, PR, 2R, 3R, NH, CO
Potential Impact 3.5-29. Long-term effects on wildlife from alteration of wildlife movement corridors.							
Increased wildlife movement opportunities		L	PP, PR, 2R, 3R, NH	CO			
Wildlife-friendly fencing		L		PP, PR, 2R, 3R, NH			
Potential Impact 3.5-30. Long-term effect on terrestrial wildlife from an increase in the distribution of salmon-derived nutrients upstream of Iron Gate, Copco No. 1 and Copco No. 2 dams.							
		L	PP, PR, NH, CO	2R, 3R			
Potential Impact 4.2.5-1. Effects of 2017 court-ordered flushing and emergency dilution flows released from Iron Gate Dam on foothill yellow-legged frog and western pond turtle breeding.							
Hydroelectric Reach (foothill yellow-legged frogs)	S					NP, CO	
Hydroelectric Reach (western pond turtles)	S			NP, CO			

Potential Impacts							
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Flood Hydrology							
Potential Impact 3.6-1 Reservoir drawdown and dam removal could result in short-term increases in downstream surface water flows and result in exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.6-2 Under the Proposed Project recreational facilities currently located on the banks of the existing reservoirs would be removed following drawdown and could change flood hydrology.							
	S	L	PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.6-3. The long-term FEMA100-year floodplain inundation extent downstream from Iron Gate Dam could change between river miles 193 and 174, potentially exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.							
Exposing structures to a substantial risk of damage due to flooding		L				PP, PR, 2R, 3R, NH	
Exposing people and/or structures to a substantial risk of flooding related to flood forecasting		L	PP, PR, 2R, 3R, NH				
Potential Impact 3.6-4. The FEMA 100-year floodplain inundation extent downstream from J.C. Boyle Dam could change between the California-Oregon state line and Copco No. 1 Reservoir, potentially exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.							
		L	PP, PR, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.6-5. The release of sediment stored behind the Lower Klamath Project dams and resulting downstream sediment deposition under the Proposed Project could result in potentially exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.6-6. Dam failure could flood areas downstream of the Lower Klamath Project.								
	S			PP, NP, PR, 2R, 3R, NH, CO				
		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 4.2.6-1. The FEMA 100-year floodplain inundation extent downstream from Iron Gate Dam could change due to 2017 flow requirements, potentially exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.								
	S	L		NP (S only), CO				
Potential Impact 4.2.6-2. The FEMA 100-year floodplain inundation extent downstream from J.C. Boyle Dam could change due to 2017 flow requirements between the California-Oregon state line and Copco No. 1 Reservoir, potentially exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.								
	S	L		NP (S only), CO				
Groundwater Resources								
Potential Impact 3.7-1. Groundwater levels in existing wells adjacent to the reservoirs could decline in response to the decrease in reservoir surface-water elevations if the dams, and therefore reservoirs, are removed.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.7-2. The Proposed Project could interfere with groundwater recharge and adversely affect surface water conditions in the Klamath River.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Water Supply/Water Rights								
Potential Impact 3.8-1 Dam removal could change the amount of surface water flow available for diversion under existing water rights in the mainstem Klamath River within the Hydroelectric Reach and downstream from Iron Gate Dam.								
	S	L		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.8-2. Dam removal could change the amount of surface water flow available for diversion from Upper Klamath Lake and/or Keno Reservoir to California water users in the USBR Klamath Irrigation Project.								
	S	L		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.8-3. Release of stored sediment during reservoir drawdown could change Klamath River geomorphology and affect water intake pumps downstream from Iron Gate Dam.								
	S			NP, CO	WSWR-1	PP, PR, 2R, 3R, NH		
Potential Impact 3.8-4. Relocation of the City of Yreka water supply pipeline after drawdown of Iron Gate Reservoir could affect water supply.								
	S			NP, CO	WSWR-2	PP, PR, 2R, 3R, NH		
Potential Impact 3.8-5. Removal and potential replacement of recreational facilities currently located on the banks of the existing reservoirs could affect water supply and/or water rights.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 4.2.8-1. Water availability changes from coordinated operations under 2017 flow requirements.								
	S	L		NP (S only), CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Air Quality							
Potential Impact 3.9-1. Conflict with or obstruct implementation of the California Regional Haze Plan.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.9-2. Exceedance of the Siskiyou County Air Pollution Control District emissions thresholds in Rule 6.1 (Construction Permit Standards for Criteria Air Pollutants).							
	S		NP, CO			PP, PR, 2R, 3R, NH	
Potential Impact 3.9-3. Short-term cumulative increase in criteria pollutants for which the Siskiyou County Air Pollution Control District is non-attainment.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.9-4. Short-term exposure of sensitive receptors to substantial toxic air contaminant concentrations.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.9-5. Short-term exposure to objectionable odors near construction sites.							
	S		PP, NP, PR, CO, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Greenhouse Gas Emissions							
Potential Impact 3.10-1. Generation of greenhouse gas emissions, either directly or indirectly, that would exceed 10,000 MT CO ₂ e.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.10-2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Geology, Soils, and Mineral Resources							
Potential Impact 3.11-1. Reservoir drawdown could result in changes to geologic hazards, such as seismic or volcanic activity.							
	S	L	PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.11-2. Soil disturbance associated with heavy vehicle use, excavation, and grading.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.11-3. Reservoir drawdown could result in hillslope instability in reservoir rim areas.							
J.C. Boyle Reservoir	S		PP, NP, PR, CO, NH				
Copco No. 1 Reservoir	S		NP, CO	GEO-1	PP, PR, 2R, 3R, NH		
Iron Gate Reservoir	S		PP, NP, PR, CO, 2R, 3R, NH				

Potential Impacts							
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.11-4. Reservoir drawdown could result in short-term instability of embankments at the earthen dams (Iron Gate and J.C. Boyle).							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.11-5. Reservoir drawdown could result in substantial short-term sediment deposition in the Klamath River downstream of Iron Gate Dam due to erosion of reservoir sediment deposits and a long-term change in sediment supply and transport due to dam removal.							
Middle Klamath River to confluence with Cottonwood Creek	S		NP, CO			PP, PR, 2R, 3R, NH	
Middle Klamath River downstream of Cottonwood Creek, Lower Klamath River, Klamath River Estuary, Pacific Ocean nearshore environment	S		PP, NP, PR, CO, 2R, 3R, NH				
Hydroelectric Reach, Middle and Lower Klamath River, Klamath River Estuary		L	PP, PR, 2R, 3R, NH	CO			
Pacific Ocean nearshore environment		L		PP, PR, CO, 2R, 3R, NH			
Potential Impact 3.11-6. Reservoir drawdown could result in increased bank erosion in the Klamath River downstream of Iron Gate Dam.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.11-7. Reservoir drawdown could reduce or eliminate the availability of a known mineral resource or a locally-important mineral resource recovery site.							
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH			

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Historical Resources and Tribal Cultural Resources								
Potential Impact 3.12-1. Pre-dam-removal activities that involve disturbance of the landscape, including construction or improvement of associated roads, bridges, water supply lines, staging areas, disposal sites, hatchery modifications, recreation site removal and/or development, and culvert construction and improvements could result in potential exposure of or damage to known Tribal Cultural Resources through ground-disturbing construction and disposal activity and increased access to sensitive areas								
	S	L		NP (S only)	TCR-1, TCR-2, TCR-3, TCR-4			PP, PR, CO, 2R, 3R, NH
Potential Impact 3.12-2. Drawdown of Iron Gate, Copco No. 1, and Copco No. 2 reservoirs could result in shifting, erosion, and exposure of known or unknown, previously submerged Tribal Cultural Resources								
	S	L		NP (S only), CO	TCR-1, TCR-2, TCR-3, TCR-4			PP, PR, 2R, 3R, NH
Potential Impact 3.12-3. Reservoir drawdown could result in erosion or flood disturbance to Tribal Cultural Resources located along the Klamath River								
Hydroelectric Reach between J.C. Boyle Dam and Copco No. 1 Reservoir	S	L		PP, NP, PR, CO, 2R, 3R, NH				
Middle Klamath River from Iron Gate Dam to Humbug Creek	S	L		NP, CO	TCR-1, TCR-2, TCR-3			PP, PR, 2R, 3R, NH
Middle Klamath River downstream of Humbug Creek and Lower Klamath River excluding the Yurok Reservation (approximately RM 0 to RM 45)	S	L		PP, NP, PR, CO, 2R, 3R, NH				
Yurok Reservation (approximately RM 0 to RM 45) along Lower Klamath River and Klamath River Estuary	S	L		NP, CO	TCR-5	PP, PR, 2R, 3R, NH		

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.12-4. Project activities associated with removal of Iron Gate, Copco No. 1, and Copco No. 2 dams could result in physical disturbance to known or unknown Tribal Cultural Resources from blasting or other removal techniques								
	S	L		NP (S only)	TCR-1, TCR-2, TCR-3, TCR-4			PP, PR, CO, 2R, 3R, NH
Potential Impact 3.12-5. Ground disturbance associated with reservoir restoration, recreation site removal and/or development, and disposal site restoration could physically disturb known Tribal Cultural Resources. Additionally, ongoing road and recreation site maintenance has the potential to disturb known Tribal Cultural Resources								
	S	L		NP (S only)	TCR-1, TCR-2, TCR-3, TCR-4			PP, PR, CO, 2R, 3R, NH
Potential Impact 3.12-6. During and following reservoir drawdown activities at Iron Gate, Copco No. 1, and Copco No. 2 reservoirs there is an increased potential for looting of Tribal Cultural Resources (short term and long term).								
Iron Gate Reservoir and Copco No. 1 Reservoir	S	L		NP, CO	TCR-2, TCR-4			PP, PR, 2R, 3R, NH
Copco No. 2 Reach	S	L		NP, CO	TCR-2, TCR-4			PP, PR, 3R, NH
Potential Impact 3.12-7. Short-term erosion caused by high-intensity and/or duration precipitation events could cause exposure of or disturbance to known or unknown Tribal Cultural Resources within the reservoir footprints immediately following reservoir drawdown and prior to vegetation establishment/full stabilization of sediment deposits								
	S			NP, CO	TCR-1, TCR-2, and TCR-3		PP, PR, 2R, 3R, NH	
Potential Impact 3.12-8. Long-term (post-removal) impacts to Tribal Cultural Resources as a result of dam removal from increased looting opportunities and from surface and subsurface erosion of Tribal Cultural Resources								
Prior to land transfer		L		CO			PP, PR, 2R, 3R, NH	
After land transfer		L			TCR-1, TCR-2, TCR-3, TCR-6, TCR-7, and TCR-8	PP, PR, 2R, 3R, NH		

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.12-9. Klamath Cultural Riverscape Contributing Aspect – Combined effects on the Klamath River fishery of dam removal, changes in hatchery production, and increased habitat for salmonids								
	S			PP, NP, PR, CO, 2R, 3R, NH				
		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 3.12-10. Klamath Cultural Riverscape Contributing Aspect: Ability of tribes to use the Middle and Lower Klamath River for ceremonial and other purposes due to alterations in riverine water quality and changes in the extent of nuisance and/or noxious blue-green algae blooms.								
	S	L	PP, PR, 2R, 3R, NH	NP (S only), CO				
Potential Impact 3.12-11. Potential impacts to Copco No. 1 Dam, Copco No. 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and the Klamath River Hydroelectric Project District as a whole.								
J.C. Boyle Reservoir and associated hydroelectric facilities	S	L		NP (S only), CO			PP, PR, NH	
Copco No. 1 Dam and associated hydroelectric facilities	S	L		NP (S only), CO			PP, PR, 2R, 3R, NH	
Copco No. 2 Dam and associated hydroelectric facilities	S	L		NP (S only), CO			PP, PR, 3R, NH	
Iron Gate Dam and associated hydroelectric facilities	S	L		NP (S only), CO			PP, PR, 2R, 3R, NH	
Klamath River Hydroelectric Project District	S	L		NP (S only), CO			PP, PR, 2R, 3R, NH	

Potential Impacts								
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.12-12 Potential impacts to submerged historic-period archaeological sites upon reservoir drawdown and exposure providing new access opportunities for artifact collecting and unauthorized excavation								
	S	L		NP (S only), CO	TCR-2 and TCR-3			PP, PR, 2R, 3R, NH
Potential Impact 3.12-13. Drawdown of Iron Gate, Copco No. 1, and Copco No. 2 reservoirs could shift, erode, or expose historic-period archaeological resources resulting in increased potential for damage and looting								
	S	L		NP (S only), CO	TCR-2 and TCR-3			PP, PR, 2R, 3R, NH
Potential Impact 3.12-14. Reservoir drawdown could result in short-term erosion or flood disturbance to historic-period cultural resources located along the Klamath River								
Middle Klamath River from Iron Gate Dam to Humbug Creek	S			NP, CO	TCR-3			PP, PR, 2R, 3R, NH
Hydroelectric Reach excluding Iron Gate Dam, Middle Klamath River downstream of Humbug Creek, Lower Klamath River, Klamath River Estuary	S			PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.12-15. Project activities associated with removal of Iron Gate, Copco No. 1, and Copco No. 2 dams could result in physical disturbance to historic-period cultural resources from blasting or other removal techniques								
	S			NP	TCR-3			PP, PR, CO, 2R, 3R, NH
Potential Impact 3.12-16. Ground disturbance associated with reservoir restoration, recreation site removal and/or development, and disposal site restoration could physically disturb historic-period cultural resources. Additionally, ongoing road and recreation site maintenance may have the potential to disturb known historic-period cultural resources								
	S			NP	TCR-2 and TCR-3			PP, PR, CO, 2R, 3R, NH

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Paleontologic Resources								
Potential Impact 3.13-1. The Proposed Project could result in substantial adverse effects on, or destruction of, High Potential Paleontologic Resources through exposure or slope failure.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Land Use and Planning								
Potential Impact 3.14-1. Removal of the reservoirs, construction-related traffic, and/or land transfer could change connectivity between areas of a community.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.14-2. The Proposed Project would not conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect in a manner that would prevent the avoidance or mitigation result sought to be achieved by the plan, policy, or regulation.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Agriculture and Forestry Resources								
Potential Impact 3.15-1. Conversion of farmland to non-agricultural use or conflict with Williamson Act land or agricultural zoning.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.15-2. Conversion of forest lands to non-forest use or conflict with forest zoning.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				

Potential Impacts								
PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.15-3. Indirect conversion of farmland to non-agricultural use or forest land to non-forest use.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.15-4. Other changes in the existing environment that could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Population and Housing								
Potential Impact 3.16-1. Inducing substantial unplanned population growth in an area, either directly or indirectly.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.16-2. Displacement of substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Public Services								
Potential Impact 3.17-1. Increased public service response times for emergency fire, police, and medical services due to construction and demolition activities. *								
	S			NP	HZ-1			PP, PR, CO, 2R, 3R, NH

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.17-2. The Proposed Project's elimination of a long-term water source for wildfire services could substantially increase the response time for suppressing wildfires. *							
	S		PP, NP, PR, CO, 2R, 3R, NH				
	L		CO				PP, PR, 2R, 3R, NH
Potential Impact 3.17-3. Potential effects on school services and facilities.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Utilities and Service Systems							
Potential Impact 3.18-1. The Proposed Project could result in the construction of new wastewater treatment facilities or expansion of existing facilities, due to inadequate capacity to serve the Proposed Project's anticipated demand or where the construction of such facilities could cause significant environmental impacts.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.18-2. The Proposed Project could require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts.							
	S		PP, PR, CO, 2R, 3R, NH				
Potential Impact 3.18-3. The Proposed Project could exceed permitted landfill capacity to accommodate the project's solid waste disposal needs.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.18-4. The Proposed Project could violate applicable statutes and regulations related to solid waste.							
	S		PP, NP, PR, CO, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Aesthetics								
Potential Impact 3.19-1. Loss of Open Water Vistas.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.19-2. Changes in Flows and Channel Morphology.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.19-3. Changes in Visual Water Quality.								
Turbidity and reduced clarity	S			PP, NP, PR, CO, 2R, 3R, NH				
Reduced algal blooms		L	PP, PR, 2R, 3R, NH	CO				
Potential Impact 3.19-4. Visual changes resulting from reservoir drawdown and restoration including temporarily bare/unvegetated banks.								
	S			NP, CO			PP, PR, 2R, 3R, NH	
		L		PP, PR, CO, 2R, 3R, NH				
Potential Impact 3.19-5. Visual changes resulting from the removal of Lower Klamath Project dams and associated facilities and improvements to or construction of new infrastructure.								
Removal of Lower Klamath Project dams and associated facilities		L		PP, PR, 2R, 3R, NH, CO				
Improvements to and construction of new infrastructure		L		PP, PR, 2R, 3R, CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Iron Gate Hatchery		L	NH					
New recreation facilities		L		CO			PP, PR, 2R, 3R, NH	
Potential Impact 3.19-6. Short-term visual impacts of construction activities/equipment.								
	S			PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.19-7. The Project's construction or security lighting could result in new sources of substantial light or glare that would adversely affect nighttime views in the area.								
	S			NP, CO			PP, PR, CO, 2R, 3R, NH	
Recreation								
Potential Impact 3.20-1. Effects on existing recreational facilities and opportunities due to access restrictions, noise, dust, and/or sediment release resulting from construction activities.								
	S			PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.20-2. Long-term changes to or loss of reservoir-based recreation activities and facilities due to removal of Iron Gate and Copco No. 1 reservoirs.								
		L		PP, PR, CO, 2R, 3R, NH				
Potential Impact 3.20-3. Significant increase in the use of regional recreational facilities due to loss of Iron Gate and Copco No. 1 reservoirs, such that substantial physical deterioration or acceleration of deterioration of the regional facilities would occur.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative								
Geographic or Other Additional Information (as needed)	Time Frame ¹		Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.20-4. Effects on the environment due to construction of new or expansion of existing recreational facilities.								
	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Potential Impact 3.20-5. Changes to or loss of river conditions that support whitewater boating.								
Middle and Lower Klamath River	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Hell's Corner Reach	S	L		NP (S only)			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.20-6. Changes to or loss of other river-based recreation including fishing.								
Middle Klamath River between Iron Gate Dam (RM 193.1) and Humbug Creek (RM 174.3)	S	L		PP, NP (S only), PR, CO, 2R, 3R, NH				
Hydroelectric Reach, Middle Klamath River downstream of Humbug Creek (RM 174.3), and the Lower Klamath River	S	L	PP, PR, 2R, 3R, NH, CO	NP (S only)				
Potential Impact 3.20-7. Effects on Wild and Scenic River resources, designations, or eligibility for listing.								
Designated California Klamath River wild and scenic river segment, and eligible and suitable California Klamath River wild and scenic river section	S			PP, NP, PR, CO, 2R, 3R, NH				
Designated California Klamath River wild and scenic river segment, and eligible and suitable California Klamath River wild and scenic river section		L	PP, PR, 2R, 3R, NH	CO				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Hazards and Hazardous Materials							
Potential Impact 3.21-1. Proposed construction-related activities could result in substantial exposure to hazardous materials through the routine transport, use, or disposal of hazardous materials.							
	S		NP	HZ-1	PP, PR, CO, 2R, 3R, NH		
Potential Impact 3.21-2. Proposed construction-related activities could result in substantial exposure to hazardous materials through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.							
	S		NP	HZ-1	PP, PR, CO, 2R, 3R, NH		
Potential Impact 3.21-3. Proposed construction-related activities could result in substantial exposure to hazardous materials through emissions or handling of substances or waste within one-quarter mile of an existing or proposed school.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.21-4. The Proposed Project could be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could result in substantial exposure to hazardous materials.							
	S		NP	HZ-1	PP, PR, CO, 2R, 3R, NH		
Potential Impact 3.21-5. The Proposed Project could result in, for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, a substantial safety hazard for people residing or working in the project area due to a risk of traffic accidents.							
	S		PP, NP, PR, CO, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.21-6. The Proposed Project could result in, for a project within the vicinity of a private airstrip, a substantial safety hazard for people residing or working in the project area due to a risk of traffic accidents.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.21-7. Proposed construction-related activities could impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. *							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.21-8. Proposed construction-related activities and/or removal of the Lower Klamath Project reservoirs could substantially increase the public's risk of loss, injury or death associated with wildland fires.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
		L	CO			PP, PR, 2R, 3R, NH	
Transportation and Traffic							
Potential Impact 3.22-1. Proposed construction-related traffic could potentially result in a substantial increase in traffic in excess of the capacity or design of the road improvements or impairs the safety or performance of the circulation system, including transit, roadways, bicycle lanes and pedestrian paths. *							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.22-2. Proposed construction-related traffic could potentially conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways that would result in increased risk of harm to the public. *							
	S		NP			PP, PR, CO, 2R, 3R, NH	

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.22-3. Proposed construction-related traffic could result in substantially increasing hazards due to a design feature (e.g., sharp curves or narrow lanes) or incompatible uses (e.g., oversized construction equipment) that would result in an increased risk of harm to the public. *							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.22-4. The Proposed Project could result in inadequate emergency access that would result in an increased risk of harm to the public. *							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.22-5. Construction-related activities could potentially conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities resulting in an increased risk of harm to the public. *							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.22-6. The Proposed Project could potentially result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Noise							
Potential Impact 3.23-1. Use of standard construction equipment could exceed Siskiyou County General Plan criteria for maximum allowable noise levels from construction equipment.							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.23-2. Construction activities at Copco No. 1 Dam could cause short-term increases in daytime and nighttime noise levels affecting nearby residents.							
	S		NP			PP, PR, CO, 2R, 3R, NH	

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.23-3. Construction activities at Copco No. 2 Dam could cause short-term increases in noise levels affecting nearby residents.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.23-4. Construction activities at Iron Gate Dam could cause short-term increases in nighttime noise levels affecting nearby residents.							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.23-5. Reservoir restoration activities at Copco No. 1 and Iron Gate could result in short-term increases in noise levels affecting nearby residents.							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.23-6. Blasting activities at Copco No. 1, Copco No. 2, and Iron Gate Dams could increase daytime vibration levels affecting nearby residents.							
	S		NP			PP, PR, CO, 2R, 3R, NH	
Potential Impact 3.23-7. Transporting waste to off-site landfills and construction worker commutes could cause increases in traffic noise along haul routes affecting nearby residents.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.23-8. Construction activities associated with the Downstream Flood Control project component (moving or elevating legally established structures with flood risk) could produce noise and vibration associated with construction activities.							
	S		PP, NP, PR, CO, 2R, 3R, NH				
Potential Impact 3.23-9. Construction activities associated with implementation of Mitigation Measure WSWR-1 (modify water intakes) could produce noise and vibration associated with construction activities.							
	S		PP, NP, PR, CO, 2R, 3R, NH				

Potential Impacts PP = Proposed Project; NP = No Project Alternative; PR = Partial Removal Alternative; CO = Continued Operations with Fish Passage; 2R = Two Dam Removal Alternative; 3R = Three Dam Removal Alternative; NH = No Hatchery Alternative							
Geographic or Other Additional Information (as needed)	Time Frame ¹	Beneficial	No Significant Impact ²	Mitigation	No Significant Impact with Mitigation	Significant and Unavoidable	Significant and Unavoidable with Mitigation
Potential Impact 3.23-10. Construction activities associated with the deepening or replacement of existing groundwater wells adjacent to the reservoirs could produce noise and vibration affecting nearby residents.							
	S		PP, NP, PR, CO, 2R, 3R, NH				

¹ S = short term potential impact; L = long term potential impact; time frames for "S" and "L" are defined by alternative and resource area.

² No significant impact - potential effect either would not cause any adverse alterations to existing conditions or would cause alterations but they would not result in a significant adverse effect (includes determinations of no impact, less than significant impact, no change from existing adverse conditions, no change from existing conditions).

* Indicates a *Significant and Unavoidable Impact* that would be reduced to *No Significant Impact with Mitigation* if one or more Recommended Measures were to be implemented. Due to federal preemption the State Water Board cannot guarantee the implementation of Recommended Measures.

This page left blank intentionally.