

Chapter 5

Other Required Disclosures

Other required disclosures of environmental documents include irreversible and irretrievable commitment of resources, the relationship between short-term uses and long-term productivity, growth inducing impacts, summary of environmental impacts by alternative, significant and unavoidable impacts, preferred alternative, and the environmentally superior alternative.

5.1 Irreversible and Irretrievable Commitment of Resources

According to the National Environmental Policy Act (NEPA), an environmental impact statement (EIS) must contain a discussion of irreversible and irretrievable commitment of resources that would result from the Proposed Action if it was implemented (40 CFR Section 1502.16). The irreversible commitment of resources generally refers to the use or destruction of a resource that cannot be replaced or restored over a long period of time. The irretrievable commitment of resources refers to the loss of production or use of natural resources and represents lost opportunities for the period when the resource cannot be used. The California Environmental Quality Act (CEQA) also requires a discussion of any significant effect on the environment that would be irreversible if the project were implemented or would result in an irretrievable commitment of resources (CEQA Guidelines Section 15126(c)).

Dam removal, deconstruction, construction, and restoration activities under the Proposed Action and the Klamath Basin Restoration Agreement (KBRA) programs and plans would involve the consumption of nonrenewable natural resources. These nonrenewable natural resources would consist of petroleum for fuels necessary to operate equipment used during deconstruction activities. The Proposed Action would include removal of four dams and all power generation facilities. This would result in the generation of waste from the concrete, mechanical, and electrical items at the dams and power facilities. Petroleum fuels would be used to haul these materials to disposal sites in the project area. In addition to fuels used in transportation, the use of the disposal sites would constitute an irreversible and irretrievable commitment of resources. Concrete and earthen materials would be used as backfill to bury dam structures, backfill the excavated tailrace channels, and restore the river to its pre-dam appearance. These materials would be permanently committed during implementation of the Proposed Action. Construction activities necessary for implementation of KBRA programs and plans would require the use of nonrenewable natural resources including petroleum for fuels and other construction materials.

5.2 Relationship Between Short-term Uses and Long-term Productivity

As required by NEPA (40 CFR Section 1502.16), this section describes the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity.

5.2.1 Klamath Hydroelectric Settlement Agreement

All four action alternatives involve demolition and/or construction activities including removing the dams and power generation facilities or constructing fish passage facilities. Dam removal (Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative) and the construction of fish passage facilities (under the Fish Passage at Four Dams and Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternatives) would require short-term uses of capital, labor, fuels, and construction materials, as well as the creation of temporary new access roads and storage pads needed during deconstruction activities.

Removal of reservoirs at the Four Facilities under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would benefit water quality by converting existing reservoir areas to a free-flowing river. Klamath Hydroelectric Project reservoirs have been shown to create higher water temperatures than those that would occur under natural conditions. Therefore, removal of the dams and return of the reservoirs to a natural flowing river would result in long-term beneficial effects on water temperature and overall water quality. In turn, improvements in water quality could result in improvements in scenic resources, such as water clarity or fish viewing opportunities. Further, removal of the reservoirs could result in beneficial effects on dissolved oxygen and pH levels in the water, thus increasing the likelihood of the free-flowing river consistently supporting beneficial uses. Other benefits to long-term productivity could result from decreases in the levels of microcystin and chlorophyll-*a* concentrations.

As described above, implementation of the Proposed Action would result in the drawdown and removal of reservoirs at the Four Facilities and would eliminate reservoir recreational opportunities at these sites. However, improved water quality as well as the return of the Klamath River to free-flowing river conditions would also result in benefits for other water-contact-based recreational opportunities, including recreational fishing and some whitewater boating. Removing the Four Facilities would result in the long-term loss power generating capacity and the associated long-term increases in green house gas emissions.

Long-term beneficial effects would also occur for aquatic resources under the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative. Changed habitat conditions resulting from dam removal would reduce

impacts on salmonids from fish disease and parasites. Long-term changes to the flow regime of the Klamath River (under the Proposed Action and the Partial Facilities Removal Alternative) would benefit fall-run Chinook using the Lower Klamath River Reach. In addition, the absence of the dams would provide access to hundreds of miles of potential habitat in at least 49 tributaries upstream of Iron Gate Dam including Fall, Jenny, Shovel, and Spencer creeks, among others. Under the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, flow increases would provide more habitat than under existing conditions for redband/rainbow trout and other resident riverine species, as well as any anadromous fish or lamprey that reestablish in the Hydroelectric Reach, but habitat gains would be less than under the Proposed Action. While removal of the two dams would eliminate existing habitat in Copco 1 and Iron Gate Reservoirs for adult shortnose and Lost River suckers, habitat within J.C. Boyle Reservoir would remain and higher flow releases would be made through the J.C. Boyle bypass reach than under existing conditions. Higher baseflows would also be provided in the Copco 2 bypass reach. These modifications would provide a benefit for fish living in this reach, including redband trout and anadromous fish. Dam removal would also restore habitat connectivity on the mainstem Klamath River and create additional habitat within the Hydroelectric Reach, thus increasing long-term productivity of coho and Chinook salmon, steelhead, and Pacific lamprey. Increases in fish populations would also result in beneficial effects for scenic fish viewing, recreational fishing, and conditions for species traditionally and culturally important to Indian Tribes.

Under the Fish Passage at Four Dams Alternative, long-term fishery productivity would increase in the basin due to water quality improvements from implementation of Oregon and California Total Maximum Daily Loads (TMDLs). Under this alternative, the hydrology of the Klamath River from Iron Gate Dam to the Klamath River Estuary would generally remain the same as existing conditions; however, fish would be able to migrate past the dams and would gain access to substantial areas of additional habitat. This access could still be delayed or impaired at the ladders, and continuing adverse water quality conditions in the reservoirs could also impair access to additional habitat. However, United States Department of the Interior (DOI) and United States Department of Commerce (DOC) prescriptions include elements to limit delays through reservoirs and fish ladders due to water quality issues. Implementation of fish passage at the dams under the Fish Passage at Four Dams Alternative would benefit anadromous fisheries in the Klamath River, thus resulting in long-term beneficial effects on recreational fishing.

Removal of dams and reservoirs under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in gains in riparian habitat and wildlife corridors. The dams and reservoirs act as a barrier to terrestrial wildlife movement and migration. Elimination of the dams and reservoirs will remove these artificial barriers and allow for more natural gene-flow and population interactions.

Long-term beneficial effects on environmental justice populations would occur under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative. The tribes' heavy

reliance on social services and food subsidies is a direct result of long standing environmental injustices that have stripped tribal people of their ability to engage in long-standing traditions and subsistence and commercial harvest activities. Increases in the populations of Fall- and Spring-run Chinook salmon, coho salmon, and summer and winter steelhead would allow tribes to increase subsistence fishing and make fish a larger part of their diet and ceremonies. These effects would have long-term benefits on tribal health.

5.2.2 Klamath Basin Restoration Agreement

Implementation of some elements of the KBRA, including the Phase I Fisheries Restoration Plan, could result in short-term use of resources associated with standard construction activities. Implementation of KBRA actions would require short-term uses of capital, labor, fuels, and construction materials. Construction activities related to full implementation of the KBRA could result in short-term greenhouse gas emissions. The Climate Change Assessment and Adaptive Management Plan under the KBRA would assess and address potential climate change impacts in the region. The plans will assist the region in planning and responding to the climate change impacts identified in the EIS/Environmental Impact Report (EIR). The following paragraphs describe the long-term increases in fisheries productivity that would result from KBRA actions.

The Phase I and Phase II Fisheries Restoration Plan under the KBRA would accelerate long-term improvements to fine sediment, water temperature, nutrients, and dissolved oxygen, thus increasing long-term productivity of the Klamath Basin. Long-term productivity in the Klamath Basin would also occur due to the continuation of the Williamson River Delta Project, the Agency Lake and Barnes Ranches Projects, the Wood River Wetland Restoration, the Water Use Retirement Program (WURP), and the Interim Flow and Lake Level Program. In addition to long-term benefits to water quality, the KBRA elements would expand the habitats available to fish and terrestrial species throughout the basin and would increase their viability and resilience.

In addition, KBRA implementation would result in the establishment of limitations on specific diversions for Reclamation's Klamath Project to protect flows on the mainstem and provide specific allocations of water from Klamath Reclamation Project diversions to the wildlife refuges. These actions would result in long-term benefits to water quality and habitats in the project area. The ground water monitoring plan and pumping limits under the KBRA would also protect flows on the mainstem, thus providing stable habitat conditions to support the species of the basin. Additional aspects of the KBRA that would benefit aquatic resources include the WURP and the Fish Entrainment Reduction actions.

The Fisheries Restoration Plan phases I and II would result in long-term benefits to fisheries populations and abundance, and terrestrial wildlife. Wetland habitats would benefit over the long term due to increased supplies of water delivered to wildlife refuges in the basin.

Plans and programs in the KBRA including Wood River Wetland Restoration, Future Storage Opportunities, Water Management on Reclamation’s Klamath Project, and WURP could result in long-term beneficial effects on water supply and water rights. KBRA actions would improve water supply reliability and help ensure against impacts on water supply delivery. In addition, KBRA implementation would result in long-term benefits to surface water hydrology and flood protection related to new surface and ground water storage options. The WURP is intended to permanently increase the flow of water into Upper Klamath Lake by 30,000 acre feet per year (KBRA Section 16.2.2), and could include actions to increase inflow (including upland vegetation management) that would result in beneficial effects on ground water resources. The Interim Flow and Lake Level Program (KBRA Section 20.4) would result in similar beneficial effects on ground water.

Under the Power for Water Management Program of the KBRA, irrigators participating in the program would be eligible for adjusted power rates, which would continue to allow area farmers to pump water at electricity rates that would maintain profitability of their operations. This effect would benefit farm workers as it would help farm operators stay in business. Implementation of the Power for Water Management Program could also involve the development of renewable energy sources, which would provide green energy. This would be a beneficial effect. In addition, several elements of the KBRA are intended to restore fisheries and improve water quality. These programs, combined with the Klamath County Economic Development Plan (KBRA Section 27.3) and the Tribal Programs Economic Revitalization (KBRA Section 31) could improve social services for county residents and tribal members. The Mazama Forest Project (KBRA Section 33.2) would result in the acquisition of 90,000 acres of timberland to be managed by the Klamath Tribes’ Forest Management Plan, thus benefitting the Klamath Tribes.

KBRA programs including the Phase I Fisheries Restoration Plan, Fisheries Restoration Plan – Phase II, Williamson River Delta Project, Agency Lake and Barnes Ranches, Wood River Wetland Restoration, Flood Storage Opportunities, On-Project Plan, WURP, Fish Entrainment Reduction, and the Klamath Tribes Fishing Site would have long-term beneficial effects.

5.2.3 Keno Transfer

As a connected action to removal of the Four Facilities, PacifiCorp would transfer ownership and operational responsibility of the Keno facility to the DOI. The Proposed Action and Description of Alternatives, Chapter 2, describes that PacifiCorp would transfer ownership and operational responsibility of the Keno Facility to the DOI. Operations under DOI would be consistent with the historic operations of the facility in place since the existing contract was signed on January 4, 1968; therefore, there would be no changes to operations or the surrounding areas as a result of the transfer. Any future upgrades at the Keno Facility by DOI would be subject to additional environmental compliance.

Transfer of the Keno Facility may involve the use of vehicles and the commitment of vehicle fuel.

5.2.4 East and Westside Facilities – Programmatic Measure

The Proposed Action and the Partial Facilities Removal Alternative include the decommissioning of PacifiCorp’s East and Westside Facilities as a connected action to removal of the Four Facilities. In the event of an Affirmative Secretarial Determination, under a plan outlined in the Klamath Hydroelectric Settlement Agreement (KHSA), PacifiCorp would apply to Federal Energy Regulatory Commission (FERC) for a partial surrender of its license of the East and Westside Facilities in order to decommission the generating facilities (KHSA 6.4.1(A)). PacifiCorp would be responsible for the decommissioning and for recovering its costs through “standard ratemaking procedures” (KHSA 6.4.1(B)). Once the decommissioning was completed, the lands associated with the East and Westside Facilities would be transferred to DOI.

Removing the East and Westside Facilities would result in the long-term loss of power generating capacity and the associated long-term increases in green house gas emissions. Decommissioning may involve the use of vehicles and construction equipment. This would require short-term uses of capital, labor, fuels, and construction materials.

5.3 Growth Inducing Impacts

CEQA Guidelines Section 15126.2(d) requires an environmental document to:

“Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth....”

NEPA requires that an EIS analyze direct and indirect impacts of growth-inducing effects. Growth-inducing effects under NEPA are a subset of indirect effects, which are defined as effects that “are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable” (40 CFR 1508.8(b)). Direct growth-inducing impacts generally stem from the construction of new housing, businesses, or infrastructure. Indirect growth inducement could result if a project establishes substantial new permanent employment opportunities or if it would remove obstacles hindering population growth, such as the expansion or the provision of urban services and infrastructure in an undeveloped area. Under CEQA, growth inducement may not necessarily be considered detrimental, beneficial, or of insignificant consequence. Induced growth is considered a significant impact only if it directly (or indirectly) affects the ability of agencies to provide needed public services, or if it can be demonstrated that the potential growth significantly affects the environment.

The Proposed Action and alternatives would not result in the construction of new housing either directly or indirectly. The Proposed Action and alternatives would not provide new water, wastewater, sewer, electricity, or natural gas infrastructure or facilities and would not require or create any new public services such as schools, public services, or public roads that could support increased growth in the Klamath Basin.

The Proposed Action and alternatives would require construction workers to perform the necessary construction work. Any employment required for the alternatives would be temporary and would be needed only during a 20-month period which includes an 8-month period of site preparation and partial drawdown at Copco 1 and a 12-month period for full drawdown and removal of facilities. Construction workers would likely commute to the sites from the surrounding local communities or find temporary accommodations for the duration of construction. Section 3.17, Population and Housing, analyzed all potential impacts from non-local workers as being less than significant as counties in the region have sufficient housing supply to accommodate the estimated number of non-local workers. Thus, there would be no need for the construction of new housing. Implementation of the Proposed Action or alternatives would not generate any permanent employment opportunities that would attract a substantial number of people to the region.

Restoration of the Klamath River fisheries is one of the main objectives of this project. If the fish populations were to rebound back to pre-dam levels, this could result in an increase in recreational fishing in the region, and possibly an increase in overall tourism. Such a change in visitor numbers would likely occur slowly as fish populations rebound, but would be unlikely to result in permanent population growth.

Neither the Proposed Action nor any of the alternatives would result in new housing, utilities, services, or permanent employment that could induce growth in the region, nor would the project result in any impacts that would require the provision of new housing, utilities, services, or permanent employment. The Proposed Action and alternatives would not induce growth.

5.4 Summary of Environmental Impacts

A summary of the environmental impacts identified for each alternative (including beneficial effects) is presented in Table 5-1 and Table 5-2. Table 5-1 presents impacts pursuant to both CEQA and NEPA; while Table 5-2 presents a summary of the environmental impacts for the resources analyzed in this EIS/EIR specific to only NEPA including Tribal Trust, Socioeconomics, and Environmental Justice.

For clarity, the Lead Agencies have updated the Final EIS/EIR in Tables 5-1 and 5-2 to indicate whether the effects described would be short term, long term or both, and to indicate when the effect described was analyzed at a programmatic level.

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.2 Water Quality				
Water Temperature				
Upper Klamath Basin (in the Hydroelectric Reach)				
Continued impoundment of water in the reservoirs could cause short-term and long-term seasonal water temperatures that are shifted from the natural thermal regime of the river and do not meet applicable Oregon DEQ and California Basin Plan water quality objectives and adversely affect beneficial uses in the Hydroelectric Reach.	1	NCFEC	None	NCFEC
Dam removal and/or reduction or elimination of hydropower peaking operations at J.C. Boyle Powerhouse could cause short-term and long-term alterations in daily water temperatures and diel temperature variation in the J.C. Boyle Bypass and peaking reaches.	2, 3, 4, 5	LTS - (short term ¹ and long term ²) for J.C. Boyle Bypass Reach in summer/fall B - (short term and long term) for J.C. Boyle Peaking Reach in summer/fall	None	LTS - (short term and long term) for J.C. Boyle Bypass Reach in summer/fall B - (short term and long term) for J.C. Boyle Peaking Reach in summer/fall
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term increases in spring time water temperatures and decreases in late summer/fall water temperatures in the Hydroelectric Reach downstream from Copco 1 Reservoir.	2, 3, 5	LTS - (short term and long term) for springtime B - (short term and long term) for late summer/fall	None	LTS - (short term and long term) for springtime B - (short term and long term) for late summer/fall

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Lower Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term and long-term increases in sediment deposition in the Klamath River or Estuary that could alter morphological characteristics and indirectly affect seasonal water temperatures.	2, 3, 5	NCFEC ³	None	NCFEC
Continued impoundment of water in the reservoirs could cause short-term and long-term seasonal water temperatures that are shifted from the natural thermal regime of the river and do not meet applicable California North Coast Basin Plan water quality objectives and adversely affect beneficial uses in the Klamath River downstream from Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free flowing river could result in short-term and long-term increases in spring water temperatures and decreases in late summer/fall water temperatures in the Lower Klamath River.	2, 3, 5	LTS – (short term and long term) Iron Gate Dam to Salmon River for springtime B – (short term and long term) in late summer/fall NCFEC – Klamath River downstream from Salmon River, the Klamath Estuary, and marine near shore environment	None	LTS – (short term and long term) Iron Gate Dam to Salmon River for springtime B – (short term and long term) in late summer/fall NCFEC – Klamath River downstream from Salmon River, the Klamath Estuary, and marine near shore environment
Suspended Sediments				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could result in short-term and long-term interception and retention of mineral (inorganic) suspended material by the Klamath Hydroelectric Project dams.	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of IM 7, J.C. Boyle Gravel Placement and/or Habitat Enhancement, could result in short- term increases in mineral (inorganic) suspended material in the Hydroelectric Reach.	1 ,2 ,3	LTS (short term)	None	LTS (short term)
Implementation of IM 8, J.C. Boyle Bypass Barrier Removal, could result in short-term increases in mineral suspended material in the Hydroelectric Reach due to deconstruction activities.	1	LTS (short term)	None	LTS (short term)
Implementation of IM 16, Water Diversions, could result in short-term increases in mineral (inorganic) suspended material in the Hydroelectric Reach due to diversion screening deconstruction and construction activities.	2, 3	LTS (short term)	None	LTS (short term)
Continued impoundment of water in the reservoirs could cause short- term and long-term seasonal (April through October) increases in algal-derived (organic) suspended material in the Hydroelectric Reach due to in-reservoir algal blooms.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the Hydroelectric Reach downstream from J.C. Boyle Dam.	2, 3, 5	S (short term)	None	S (short term)
Construction/deconstruction activities could cause short-term increases in suspended material in the Hydroelectric Reach due to stormwater runoff from construction/deconstruction areas.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction/deconstruction activities would include the demolition of various recreation facilities which could cause short-term increases in suspended material in the Hydroelectric Reach from stormwater runoff from the demolition areas.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Revegetation associated with management of the reservoir footprint area after dam removal could decrease the short-term erosion of fine sediments from exposed reservoir terraces in the Hydroelectric Reach.	2, 3, 5	B (short term)	None	B (short term)
Dam removal could eliminate the interception and retention of mineral (inorganic) suspended material behind the dams and result in long-term increases in suspended material in the Hydroelectric Reach.	2, 3, 5	LTS (long term)	None	LTS (long term)
Dam removal could eliminate the interception and retention of algal-derived (organic) suspended material behind the dams and result in slight long-term increases in suspended material in the Hydroelectric Reach.	2, 3, 5	LTS (long term)	None	LTS (long term)
Lower Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the lower Klamath River and the Klamath Estuary.	2, 3, 5	S (short term)	None	S (short term)
Draining the reservoirs and release of sediment could cause short-term increases in sediment loads from the Klamath River to the Pacific Ocean and corresponding increases in concentrations of suspended material and rates of deposition in the marine nearshore environment.	2, 3, 5	LTS (short term)	None	LTS (short term)
Continued impoundment of water in the reservoirs could cause short-term and long-term interception and retention of mineral (inorganic) sediments by the dams and correspondingly low levels of suspended material immediately downstream from Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Continued impoundment of water in the reservoirs could result in short-term and long-term seasonal (April through October) increases in algal-derived (organic) suspended material in the Klamath Hydroelectric Project reservoirs and subsequent transport into the Klamath River downstream from Iron Gate Dam.	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction/deconstruction activities could cause short-term increases in suspended material in the lower Klamath River, Klamath Estuary, and marine nearshore environment due to stormwater runoff from construction/deconstruction areas.	2, 3, 5	LTS (short term)	None	LTS (short term)
Revegetation associated with management of the reservoir footprint area after dam removal could decrease the short-term erosion of fine sediments from exposed reservoir terraces into the lower Klamath River and Klamath Estuary.	2, 3, 5	B (short term)	None	B (short term)
Dam removal could eliminate the interception and retention of mineral (inorganic) suspended material behind the dams and result in long-term increases in suspended material in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	LTS (long term)	None	LTS (long term)
Dam removal could eliminate the interception and retention of algal-derived (organic) suspended material behind the dams and result in long-term increases in suspended material in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Nutrients				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could result in long-term interception and retention of TP and TN in the Hydroelectric Reach on an annual basis but release (export) of TP and TN from reservoir sediments on a seasonal basis.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment could cause short-term increases in sediment- associated nutrients in the Hydroelectric Reach.	2, 3, 5	LTS (short term)	None	LTS (short term)
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels in the Hydroelectric Reach.	2, 3, 5	LTS (long term)	None	LTS (long term)
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term interception and retention of TP and TN on an annual basis but release (export) of TP on a seasonal basis.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment to the lower Klamath River could cause short-term increases in sediment-associated nutrients in the river and the Klamath Estuary.	2, 3, 5	LTS (short term)	None	LTS (short term)
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>Dissolved Oxygen</i>				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term seasonal and daily variability in dissolved oxygen concentrations in the Hydroelectric Reach, such that levels do not meet ODEQ and California North Coast Basin Plan water quality objectives and adversely affect beneficial uses.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the Hydroelectric Reach downstream from J.C. Boyle Reservoir.	2, 3, 5	S (short term)	None	S (short term)
Dam removal and conversion of reservoir areas to free-flowing river conditions could cause long-term increases in dissolved oxygen, as well as increased daily variability in dissolved oxygen, in the Hydroelectric Reach.	2, 3, 5	B (long term)	None	B (long term)
Dam removal and conversion of reservoir areas to free-flowing river conditions could cause long-term slight decreases in daily variability in dissolved oxygen in the Hydroelectric Reach at State line.	2, 3	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Lower Klamath Basin				
Continued impoundment of water at the Four Facilities could result in continued release of water with low dissolved oxygen concentrations from Iron Gate Dam into the Klamath River immediately downstream from the dam.	1, 4	NCFEC	None	NCFEC
Dam removal and sediment release could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	S - (short term) lower Klamath River from Iron Gate Dam to Clear Creek NCFEC - Klamath Estuary or marine nearshore environment	None	S – (short term) lower Klamath River from Iron Gate Dam to Clear Creek NCFEC - Klamath Estuary or marine nearshore environment
Dam removal and conversion of reservoir areas to a free-flowing river could cause long-term increases in dissolved oxygen, as well as increased daily variability in dissolved oxygen, in the lower Klamath River, particularly for the reach immediately downstream from Iron Gate Dam.	2, 3, 5	B (long term)	None	B (long term)
pH				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term elevated seasonal pH and daily variability in pH in the Hydroelectric Reach.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term slight increases in pH and daily pH fluctuations in riverine reaches in the Hydroelectric Reach.	2, 3, 5	LTS (short term and long term)	None	LTS (short term and long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term decreases in high pH (> 9 pH units) and large (0.5–1.5 pH units) daily fluctuations in the free-flowing reaches of the river that replace Copco 1 and Iron Gate Reservoirs in the Hydroelectric Reach.	2, 3, 5	B (short term and long term)	None	B (short term and long term)
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term elevated seasonal pH and daily variability in pH in the lower Klamath River downstream from Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term summertime increases in pH in the lower Klamath River downstream from Iron Gate Dam.	2, 3, 5	LTS – (long term) Lower Klamath River from Iron Gate Dam to confluence with the Scott River NCFEC – Lower Klamath River downstream from the Scott River, the Klamath Estuary, and the marine nearshore environment	None	LTS – (long term) Lower Klamath River from Iron Gate Dam to confluence with the Scott River NCFEC – Lower Klamath River downstream from the Scott River, the Klamath Estuary, and the marine nearshore environment
Chlorophyll-a and Algal Toxins				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could support long-term growth conditions for toxin-producing nuisance algal species such as <i>M. aeruginosa</i> , resulting in high seasonal concentrations of chlorophyll-a and algal toxins (i.e., microcystin) in the Hydroelectric Reach.	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal and conversion of the reservoir areas to a free-flowing river would cause short-term and long-term decreases in levels of chlorophyll- <i>a</i> and substantially reduce or eliminate algal toxins (i.e., microcystin) in the Hydroelectric Reach.	2, 3, 5	B (short term and long term)	None	B (short term and long term)
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could support long-term growth conditions for toxin-producing nuisance algal species such as <i>M. aeruginosa</i> , resulting in high seasonal concentrations of chlorophyll- <i>a</i> and algal toxins (i.e., microcystin) transported into the Klamath River from downstream from Iron Gate Dam to the Klamath Estuary, and potentially to the marine nearshore environment.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free-flowing river would cause short-term and long-term decreases in levels of chlorophyll- <i>a</i> and substantially reduce or eliminate algal toxins (i.e., microcystin) in the lower Klamath River and the Klamath Estuary.	2, 3, 5	B (short term and long term)	None	B (short term and long term)
Inorganic and Organic Contaminants				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs and associated interception and retention of sediments behind the dams could cause long-term low-level exposure to inorganic and organic contaminants for freshwater aquatic species in the Hydroelectric Reach.	1, 4, 5	NCFEC	None	NCFEC
Continued impoundment of water in the reservoirs and associated interception and retention of sediments behind the dams could cause long-term low-level exposure to inorganic and organic contaminants in the Hydroelectric Reach through human consumption of resident fish tissue.	1, 4, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Draining the reservoirs and sediment release could cause short-term increases in concentrations of inorganic and organic contaminants and result in low-level exposure for freshwater aquatic species in the Hydroelectric Reach.	2, 3, 5	LTS (short term)	None	LTS (short term)
Draining the reservoirs and sediment release could cause short-term human exposure to contaminants from contact with deposited sediments on exposed reservoir terraces and river banks within the Hydroelectric Reach.	2, 3, 5	LTS (short term)	None	LTS (short term)
Construction/deconstruction activities could cause short-term increases in inorganic and organic contaminants from hazardous materials associated with construction and revegetation equipment in the Hydroelectric Reach.	2, 3, 5	LTS (short term)	None	LTS (short term)
Reservoir area restoration activities could include herbicide application which could cause short-term levels of organic contaminants in runoff that are toxic to aquatic biota in the Hydroelectric Reach.	2, 3, 5	LTS (short term)	None	LTS (short term)
Lower Klamath Basin				
Dam removal and sediment release could cause short-term and long-term increases in concentrations of inorganic and organic contaminants and result in low-level exposure for freshwater aquatic species in the lower Klamath River and the Klamath Estuary.	2, 3, 5	LTS (short term and long term)	None	LTS (short term and long term)
Draining the reservoirs and sediment release could cause short-term human exposure to contaminants from contact with deposited sediments on exposed downstream river terraces and downstream river banks following reservoir drawdown.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction/deconstruction activities could cause short-term increases in suspended sediments and the potential for inorganic and organic contaminants from hazardous materials associated with construction equipment to be transported into the lower Klamath River, Klamath Estuary, and the marine nearshore environment.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could cause adverse water quality effects.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could result in slight decreases in ammonia levels in the Keno Impoundment/Lake Ewauna.	2, 3	B (long term)	None	B (long term)
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could cause short-term increases in suspended material in the Hydroelectric Reach during the construction period.	2, 3, 5	LTS (short term)	None	LTS (short term)
<i>KBRA – Programmatic Measures</i>				
Implementation of the Phase I Fisheries Restoration Plan could result in short-term construction-related increases in suspended materials and long-term reductions in fine sediment inputs, reduced summer water temperatures, improved nutrient interception, and increased dissolved oxygen levels.	2, 3	LTS (short term) B (long term)	None	LTS (short term) B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Phase II Fisheries Restoration Plan under the KBRA (KBRA Section 10.2) would include a continuation of the same types of resource management actions as under Phase I along with provisions for adaptive management of these actions and would therefore have the same short-term (i.e., during construction activities) and long-term impacts as Phase I.	2, 3	LTS (short term) B (long term)	None	LTS (short term) B (long term)
Implementation of the trap and haul element of the Fisheries Reintroduction and Management Plan could affect water quality during construction.	2, 3	LTS (short term)	None	LTS (short term)
Implementation of Wood River Wetland Restoration could result in short-term construction-related increases in suspended materials and long-term warmer spring water temperatures and reduced fine sediment and nutrient inputs to Upper Klamath Lake.	2, 3	LTS (short term) B (long term)	None	LTS (short term) B (long term)
Implementation of Water Diversion Limitations could result in decreased summer water temperatures in the Klamath River upstream of the Hydroelectric Reach.	2, 3	NCFEC (short term) B (long term)	None	NCFEC (short term) B (long term)
Implementation of the Water Use Retirement Program could result in decreases in summer water temperature and nutrient inputs to Upper Klamath Lake.	2, 3	NCFEC (short term) B (long term)	None	NCFEC (short term) B (long term)
Implementation of the Interim Flow and Lake Level Program could result in decreases in summer water temperature and nutrient inputs to Upper Klamath Lake.	2, 3	NCFEC (short term) B (long term)	None	NCFEC (short term) B (long term)
Implementation of the Upper Klamath Lake and Keno Nutrient Reduction Program could result in long-term decreases in nutrient inputs, increases in seasonal dissolved oxygen, and decreases in concentrations of nuisance algal species in these water bodies.	2, 3	Not determined at this time	None	Not determined at this time

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>Trap and Haul Operations – Programmatic Measure</i>				
Implementation of the trap and haul operations could affect water quality during construction.	4, 5	LTS (short term)	None	LTS (short term)
3.3 Aquatic Resources				
<i>Critical Habitat</i>				
Continued impoundment of water within the reservoirs could alter the water quality and habitat suitability within critical habitat.	1	NCFEC (short term and long term) coho, Bull Trout, Southern Resident Killer Whale, and Eulachon	None	NCFEC (short term and long term) coho, Bull Trout, Southern Resident Killer Whale, and Eulachon
	4	NCFEC (short term and long term) coho, Bull Trout, Southern Resident Killer Whale	None	NCFEC (short term and long term) coho, Bull Trout, Southern Resident Killer Whale
Reservoir drawdown associated with dam removal could alter the quality of critical habitat.	2, 3, 5	S (short term) coho LTS (short term and long term) Bull Trout and Southern Resident Killer Whale	None	S (short term)coho LTS (short term and long term) Bull Trout and Southern Resident Killer Whale

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The removal of dams and reservoirs could alter the availability and quality of critical habitat.	2, 3	B (long term) coho and eulachon LTS (short term and long term) Bull Trout and Southern Resident Killer Whale	None	B (long term) coho and eulachon LTS (short term and long term) Bull Trout and Southern Resident Killer Whale
	5	B (long term) coho LTS (short term and long term) Bull Trout and Southern Resident Killer Whale	None	B (long term) coho LTS (short term and long term) Bull Trout and Southern Resident Killer Whale
<i>Essential Fish Habitat</i>				
Continued impoundment of water within the reservoirs could alter the availability and suitability of Essential Fish Habitat (EFH).	1, 4	NCFEC (short term and long term) Chinook, coho salmon, groundfish, and pelagic fish EFH	None	NCFEC (short term and long term) Chinook, coho salmon, groundfish, and pelagic fish EFH
Reservoir drawdown associated with dam removal could alter the quality of EFH.	2, 3, 5	S (short term) Chinook and coho B (long term) Chinook and coho LTS (groundfish and pelagic fish)	None	S (short term for Chinook and coho) LTS (groundfish and pelagic fish)
The removal of dams and reservoirs could alter the availability and quality of EFH.	2, 3, 5	B (long term) Chinook and coho LTS (short term and long term) groundfish and pelagic fish	None	B (long term) Chinook and coho LTS (short term and long term) groundfish and pelagic fish

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Species Impacts				
<i>Fall-run Chinook Salmon</i>				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Fall-run Chinook salmon.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Fall-Run Chinook salmon.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect Fall-run Chinook salmon.	2, 3, 5	S (short term)	AR-1: Protection of mainstem spawning AR-2: Protection of outmigrating juveniles AR-3: Fall flow pulses AR-4: Hatchery management	LTS (short term)
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect Fall-run Chinook salmon.	2, 3, 5	B (long term)	None	B (long term)
Fish passage provisions could result in alterations in habitat availability which could affect Fall-run Chinook salmon.	4	B (short term and long term)	None	B (short term and long term)
<i>Spring-run Chinook Salmon</i>				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Spring-run Chinook salmon.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Spring-run Chinook salmon.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect spring-run Chinook salmon.	2, 3, 5	LTS (short term)	AR-2: Protection of outmigrating juveniles	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect Spring-run Chinook salmon.	2, 3, 5	B (long term)	None	B (long term)
Fish passage provisions could result in alterations in habitat availability which could affect Spring-run Chinook salmon.	4	B (short term and long term)	None	B (short term and long term)
<i>Coho Salmon</i>				
Continued impoundment of water within reservoirs at the Four Facilities could alter habitat suitability affecting coho salmon.	1	NCFEC (all population units)	None	NCFEC (all population units)
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting coho salmon.	1	NCFEC (all population units)	None	NCFEC (all population units)
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect coho salmon.	2, 3, 5 (would only remove Copco 1 and Iron Gate)	S (short term) Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units LTS (short term) Trinity River, Salmon River, and Lower Klamath River population units	AR-1: Protection of mainstem spawning AR-2: Protection of outmigrating juveniles AR-3: Fall flow pulses AR-4: Hatchery management	S (short term) Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units LTS (short term) Trinity River, Salmon River, and Lower Klamath River population units
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect coho salmon.	2, 3, 5	B (long term) Upper Klamath River, Mid-Klamath River, Shasta River, Scott River, Salmon River, and Lower Klamath River population units LTS (long term) Trinity River population units	None	B (long term) Upper Klamath River, Mid-Klamath River, Shasta River, Scott River, Salmon River, and Lower Klamath River population units LTS (long term) Trinity River population units

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Fish passage provisions could result in alterations in habitat availability which could affect coho salmon.	4	B – (short term and long term) Upper Klamath River population unit NCFEC Mid-Klamath River, Shasta River, Scott River, Salmon River, three Trinity River, and Lower Klamath River population units)	None	B - (short term and long term) Upper Klamath River population unit NCFEC Mid-Klamath River, Shasta River, Scott River, Salmon River, three Trinity River, and Lower Klamath River population units
<i>Steelhead</i>				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting steelhead.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting steelhead.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect steelhead in the short term.	2, 3, 5	S (short term) summer and winter steelhead	AR-1: Protection of mainstem spawning AR-2: Protection of outmigrating juveniles AR-3: Fall flow pulses AR-4: Hatchery management	S (short term) summer and winter steelhead
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect steelhead.	2, 3, 5	B (long term) summer and winter steelhead	None	B (long term) summer and winter steelhead
Fish passage provisions could result in alterations in habitat availability which could affect steelhead.	4	B (short term and long term)	None	B (short term and long term)
<i>Pacific Lamprey</i>				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Pacific lamprey.	1	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Pacific lamprey.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs, bedload sediment transport, and deposition which could affect Pacific lamprey in the short term.	2, 3, 5	S (short term)	AR-2: Protection of outmigrating juveniles AR-5: Pacific lamprey capture and relocation	S (short term)
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, and temperature variation, which could affect Pacific lamprey.	2, 3, 5	B (long term)	None	B (long term)
Fish passage provisions could result in alterations in habitat availability which could affect Pacific lamprey.	4	B (short term and long term)	None	B (short term and long term)
Green Sturgeon				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting green sturgeon.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting green sturgeon.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect green sturgeon.	2, 3, 5	S (short term)	AR-3: Fall flow pulses	S (short term)
Removal of dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, fish disease incidence, and algal toxins which could affect green sturgeon.	2, 3, 5	LTS (long term)	None	LTS (long term)
Fish passage provisions could result in alterations in habitat availability which could affect green sturgeon.	4	NCFEC	None	NCFEC
Shortnose Sucker and Lost River				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Lost River and shortnose suckers.	1	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Lost River and shortnose suckers.	1	NCFEC	None	NCFEC
Reservoir removal associated with dam removal could alter habitat availability and affect Lost River and shortnose suckers	2, 3, 5	S (short term)	AR-6: Sucker rescue and relocation	LTS (short term)
Restoration action associated with KBRA implementation could alter habitat availability and suitability and affect Lost River and shortnose suckers.	2	B (long term)	None	B (long term)
Fish passage provisions could affect shortnose and Lost River Sucker populations by continuing poor water quality and high rates of predation.	4, 5	LTS (short term and long term)	None	LTS (short term and long term)
Redband Trout				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting redband trout.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting redband trout.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect redband trout.	2, 3, 5	LTS (short term)	None	LTS (short term)
Dam removal would restore connectivity among the lower basin, the Hydroelectric Reach and its tributaries, and the Upper Klamath Basin, and would rehabilitate and increase availability of riverine habitat within the Hydroelectric Reach.	2, 3, 5	B (long term)	None	B (long term)
Fish passage provisions could result in alterations in habitat availability which could affect redband trout.	4	B (short term and long term)	None	B (short term and long term)
Bull Trout				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting bull trout.	1	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal and/or fish passage could alter habitat access for anadromous fish, which could affect bull trout.	2, 3, 4, 5	LTS (short term and long term)	None	LTS (short term and long term)
<i>Eulachon</i>				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting eulachon.	1, 4	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect eulachon.	2, 3, 5	LTS (long term)	None	LTS (long term)
<i>Longfin Smelt</i>				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting longfin smelt.	1, 4	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect longfin smelt.	2, 3, 5	LTS (short term and long term)	None	LTS (short term and long term)
<i>Introduced Resident Species</i>				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting introduced resident species.	1, 4	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting introduced resident species.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal would eliminate habitat for introduced resident species in the Hydroelectric Reach.	2, 3, 5	LTS ⁴ (long term)	None	LTS (long term)
Fish passage provisions could result in alterations in habitat availability which could affect introduced resident species.	4	NCFEC	None	NCFEC
<i>Freshwater mussels</i>				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting freshwater mussels.	1	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect freshwater mussels in the short term.	2, 3, 5	S (short term)	AR-7: Freshwater mussel relocation	S (short term)
Dam removal would restore connectivity among the lower basin, the Hydroelectric Reach and its tributaries, and the Upper Klamath Basin, and would rehabilitate and increase availability of riverine habitat within the Hydroelectric Reach.	2, 3, 5	B (long term)	None	B (long term)
Continued impoundment of water within the reservoirs would result in no change in suspended sediments.	4	NCFEC	None	NCFEC
<i>Benthic Macroinvertebrates</i>				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting macroinvertebrates.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect macroinvertebrates.	2, 3, 5	S (short term)	None	S (short term)
Dam removal would restore connectivity among the lower basin, the Hydroelectric Reach and its tributaries, and the Upper Klamath Basin, and would rehabilitate and increase availability of riverine habitat within the Hydroelectric Reach.	2, 3, 5	B (long term)	None	B (long term)
Fish passage provisions could result in alterations in habitat availability which could affect macroinvertebrates.	4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
IM 7, implementation of J.C. Boyle Gravel Placement and/or Habitat Enhancement and the Coho Enhancement Fund could result in alterations to habitat availability and habitat quality, and affect aquatic species.	1,2,3	B – (long term) Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, redband trout, and benthic macroinvertebrates. Coho Salmon (Upper Klamath River population unit) LTS – (long term) all other Coho population units, bull trout, freshwater mussels, shortnose and Lost River suckers. NCFEC – green sturgeon, eulachon, and Southern Resident Killer Whales	None	B – (long term) Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, redband trout, and benthic macroinvertebrates. Coho Salmon (Upper Klamath River population units. LTS – (long term) all other Coho population units, , bull trout, freshwater mussels, shortnose and Lost River suckers. NCFEC – green sturgeon, eulachon, and Southern Resident Killer Whales

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<p>IM 8, implementation of J.C. Boyle Bypass Barrier Removal could result in alterations to habitat availability, and affect aquatic species.</p>	<p>1, 2</p>	<p>B-(long term) Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, and redband trout. Coho Salmon (Upper Klamath River population units) LTS – (long term) all other Coho population units, bull trout, and shortnose and Lost River suckers. NCFEC – macroinvertebrates, freshwater muscles, green sturgeon, eulachon, Southern Resident Killer Whales</p>	<p>None</p>	<p>B- (long term) Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, and redband trout. Coho Salmon (Upper Klamath River population units) LTS – (long term) all other Coho population units, bull trout, and shortnose and Lost River suckers. NCFEC – macroinvertebrates, freshwater muscles, green sturgeon, eulachon, Southern Resident Killer Whales</p>

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
IM 16, implementation of the interim measure Water Diversions could result in alterations to habitat availability and habitat quality and affect aquatic species.	3	B- (long term) Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, redband trout, and benthic macroinvertebrates. Coho Salmon (Upper Klamath River population units) LTS – (long term) all other Coho population units, bull trout, freshwater mussels, shortnose and Lost River suckers NCFEC – green sturgeon, eulachon, Southern Resident Killer Whales	None	B- (long term) Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, redband trout, and benthic macroinvertebrates. Coho Salmon (Upper Klamath River population units) LTS – (long term) all other Coho population units, bull trout, freshwater mussels, shortnose and Lost River suckers NCFEC – green sturgeon, eulachon, Southern Resident Killer Whales
<i>Deconstruction Impacts</i>				
The removal of dams and reservoirs and the construction of fish passage facilities could disturb the river channel during construction which could affect aquatic species.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could cause adverse aquatic resource effects.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could cause adverse aquatic resource effects.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Removal of the dams will require the new construction to relocate of the City of Yreka Water Supply Pipeline. Relocation of the City of Yreka Water Supply Pipeline could disturb the river channel during construction and affect aquatic resources.	2, 3, 5	LTS (short term)	None	LTS (short term)
<i>KBRA – Programmatic Measures</i>				
Implementation of Phases I and 2 Fisheries Restoration Plans and Fisheries Monitoring Plan could result in alterations to water quantity, water quality, habitat availability and habitat quality, and affect aquatic species.	2, 3	B – (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, benthic macroinvertebrates, and shortnose and Lost River suckers, coho salmon except for the Trinity River Populations. LTS – (long term) coho salmon (Trinity River population unit) NCFEC - green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, and freshwater mussels	None	B (long term)- fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, benthic macroinvertebrates, and shortnose and Lost River suckers, coho salmon except for the Trinity River Populations) LTS – (long term) coho salmon (Trinity River population unit) NCFEC - green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, and freshwater mussels

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of Phase I of the Fisheries Reintroduction and Management Plan could result in alterations to habitat availability (fish access), and could affect aquatic species.	2, 3	B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, Southern Resident Killer Whales, benthic macroinvertebrates, coho except those Trinity River population units; LTS - (long term) redband trout, shortnose and Lost River suckers NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, and freshwater mussels	None	B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, Southern Resident Killer Whales, benthic macroinvertebrates, coho except those Trinity River population units LTS - (long term) redband trout, shortnose and Lost River suckers NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, and freshwater mussels

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<p>Implementation of Water Diversion Limitations could result in reducing uncertainties associated with maintaining adequate ecological flows for aquatic species and their habitats, especially in low-flow years, and could alter water quality, and water temperatures in certain seasons and affect aquatic species.</p>	<p>2, 3</p>	<p>B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates</p>	<p>None</p>	<p>B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates</p>

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of On-Project Plan could result in alterations to water quantity and water quality and affect aquatic species.	2, 3	B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers. Coho salmon, except those Trinity River population units NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates	None	B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers. Coho salmon, except those Trinity River population units NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The Water Use Retirement Program could alter water quantity and water quality, and affect aquatic species.	2, 3	B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates	None	B - (long term) fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units NCFEC - coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Fish Entrainment Reduction could result in alterations to potential alterations to mortality risk and affect aquatic species.	2, 3	B - (long term) shortnose and Lost River suckers, redband trout, fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, and coho salmon from the Upper Klamath River population unit NCFEC - all other coho salmon population units, green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates	None	B - (long term) shortnose and Lost River suckers, redband trout, fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, and coho salmon from the Upper Klamath River population unit NCFEC - all other coho salmon population units, green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates
Implementation of the Klamath Tribes Interim Fishing Site could result in alterations to managed harvest mortality of fish species that are culturally important to the Klamath River Tribes,	2, 3	NCFEC	None	NCFEC
Implementation of the Interim Flow and Lake Level Program could result in decreases in summer water temperature and nutrient inputs to Upper Klamath Lake.	2, 3	B (long term)	None	B (long term)
<i>Trap and Haul Operations – Programmatic Measure</i>				
Implementation of trap and haul measures could affect aquatic species.	4, 5	B – (long term) fall-run Chinook	None	B – (long term) fall-run Chinook

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.4 Algae				
<i>Upper Klamath Basin Upstream of the Influence of J.C. Boyle Reservoir</i>				
Dam removal activities could decrease the long-term spatial extent, temporal duration, toxicity, or concentration of nuisance and/or noxious phytoplankton in the area of analysis.	2, 3, 5	NCFEC	None	NCFEC
Dam removal activities could decrease the long-term spatial extent, temporal duration, or biomass of nuisance periphyton in the area of analysis.	2, 3, 5	NCFEC	None	NCFEC
<i>Hydroelectric Reach</i>				
Continued impoundment of water in the reservoirs could support long-term growth of nuisance and/or noxious phytoplankton blooms in the Hydroelectric Reach.	1, 4	NCFEC	None	NCFEC
Sediment release associated with dam removal could cause short-term increases in sediment-associated nutrients downstream from J.C. Boyle Dam that could stimulate nuisance and/or noxious phytoplankton growth in the Hydroelectric Reach.	2, 3	NCFEC	None	NCFEC
Removal of the reservoirs would eliminate lacustrine habitat behind the dams and could decrease or eliminate the long-term spatial extent, temporal duration, or concentration of nuisance and/or noxious phytoplankton blooms in the Hydroelectric Reach and subsequent transport to the Klamath River from downstream from Iron Gate Dam to the Klamath Estuary.	2, 3, 5	B (long term)	None	B (long term)
Sediment release associated with the Proposed Action could cause short-term increases in sediment-associated nutrients downstream from J.C. Boyle Dam that could stimulate nuisance periphyton growth in the Hydroelectric Reach.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Conversion of the reservoir areas to a free-flowing river, and the elimination of hydropower peaking operations could cause long-term increases in nutrient levels and biomass of nuisance periphyton in low-gradient channel margin areas within the Hydroelectric Reach downstream from J.C. Boyle Dam. ⁵	2, 3, 5 ⁶	S (long term)	None	S (long term)
Construction and deconstruction activities would include the demolition of various recreation facilities that could affect algae in the Hydroelectric Reach.	2, 3, 5	NCFEC	None	NCFEC
Increases in J.C. Boyle Dam flow releases and associated increases in summer and early fall water temperatures in the Bypass Reach (Section 3.2.4.3.4), as well as decreases in peaking flows and less flow and water temperature variation in the Peaking Reach, could result in small amounts of periphyton colonization in the Klamath River downstream from J.C. Boyle Dam and upstream of Copco 1 Dam.	4	LTS	None	LTS
Implementation of IM 7, J.C. Boyle Gravel Placement and/or Habitat Enhancement, could result in increased bedload mobility and increased scour of nuisance periphyton in the Hydroelectric Reach.	2	B (long term)	None	B (long term)
<i>Klamath River Downstream from Iron Gate Dam</i>				
Continued impoundment of water in the reservoirs could support long-term growth of seasonal nuisance and/or noxious phytoplankton blooms in the Hydroelectric Reach and subsequent transport into the Klamath River downstream from Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Continued impoundment of water at the Four Facilities could support long-term growth of nuisance periphyton such as Cladophora downstream from Iron Gate Dam.	1	NCFEC	None	NCFEC
	4	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of the reservoirs would eliminate lacustrine habitat behind the dams and could substantially reduce or eliminate the long-term transport of nuisance and/or noxious phytoplankton blooms and concentrations of algal toxins into the Klamath River downstream from Iron Gate Dam.	2, 3, 5	B (long term)	None	B (long term)
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels and biomass of nuisance periphyton in the Klamath River downstream from Iron Gate Dam.	2, 3, 5	LTS (long term)	None	LST (long term)
Construction and deconstruction activities would include the demolition of various recreation facilities that could affect algae downstream from Iron Gate Dam.	2, 3, 5	NCFEC	None	NCFEC
<i>Klamath Estuary</i>				
Continued impoundment of water in the reservoirs could support long-term growth of nuisance and/or noxious phytoplankton blooms in the Hydroelectric Reach and subsequent transport into the Klamath Estuary.	1, 4	NCFEC	None	NCFEC
Removal of the reservoirs would eliminate lacustrine habitat behind the dams could substantially reduce or eliminate the long-term transport of nuisance and/or noxious phytoplankton blooms and concentrations of algal toxins into the Klamath Estuary.	2, 3, 5	B (long term)	None	B (long term)
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels and periphyton biomass in the Klamath Estuary.	2, 3, 5	LTS (long term)	None	LTS (long term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could cause adverse algae effects.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>East and Westside Facilities – Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could cause adverse algae effects.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation - Programmatic Measure</i>				
Relocation of the Yreka Water Supply Pipeline, required as part of the removal of Iron Gate Dam, could affect algae.	2, 3, 5	NCFEC	None	NCFEC
<i>KBRA – Programmatic Measures</i>				
Implementation of restoration actions, programs, and/or plans presented in the KBRA would accelerate restoration actions currently underway throughout the Klamath Basin and reduce nuisance and/or noxious phytoplankton blooms through their beneficial effects on flow and water quality.	2, 3	B (long term)	None	B (long term)
Implementation of the Phase I Fisheries Restoration Plan could result in a long-term reduction in nutrients and associated decreases in nuisance and/or noxious phytoplankton and periphyton blooms.	2, 3	B (long term)	None	B (long term)
Implementation of the Phase II Fisheries Restoration Plan under the KBRA (KBRA Section 10.2) would include a continuation of the same types of resource management actions as under Phase I along with provisions for adaptive management of these actions and would therefore have the same impacts as Phase I.	2, 3	B (long term)	None	B (long term)
Implementation of Wood River Wetland Restoration could result in reduced nutrient inputs to Upper Klamath Lake and associated decreases in nuisance and/or noxious phytoplankton blooms.	2, 3	B (long term)	None	B (long term)
Implementation of the Water Use Retirement Program could result in decreases in nutrient inputs to Upper Klamath Lake and associated decreases in nuisance and/or noxious phytoplankton blooms.	2, 3	B (long term)	None	B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Interim Flow and Lake Level Program could result in decreases in nutrient inputs to Upper Klamath Lake and associated decreases in nuisance and/or noxious phytoplankton blooms.	2, 3	B (long term)	None	B (long term)
Implementation of the Upper Klamath Lake and Keno Nutrient Reduction Program could result in decreases in nutrient inputs to Upper Klamath Lake and Keno Impoundment/Lake Ewauna and associated decreases in nuisance and/or noxious phytoplankton blooms.	2, 3	N/A'	N/A	N/A
3.5 Terrestrial Resources				
Continued impoundment of water in the reservoirs could result in the continuance of various stressors in the area of analysis including habitat degradation, invasive species, barriers to movement of some terrestrial wildlife species, and uncertainties in water deliveries to the NWRs.	1	NCFEC	None	NCFEC
Construction activities could result in the loss of wetland and riparian vegetation communities and culturally important species including willows.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities could result in direct mortality or harm to special-status invertebrate, amphibian and reptile species during construction.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities could result in nest abandonment by birds, including special-status bird species, during construction.	2, 3, 4, 5	LTS (short term)	TER-2: Nesting Bird Surveys TER-3: Bald and Golden Eagle Surveys	LTS (short term)
Construction activities could result in on the loss of special-status plants.	2, 3, 4, 5	LTS (short term)	TER-1: Habitat Rehabilitation Plan TER-4: Surveys for Special Status Plants	LTS (short term)
Construction activities could result in adverse impacts on wildlife from riparian habitat loss.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Removal of reservoirs and associated loss of habitat could result in impacts on wildlife.	2, 3, 5	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal and the flushing of sediments could result in long-term impacts on riparian habitat from sedimentation in downstream reaches.	2, 3, 5	LTS (long term)	None	LTS (long term)
Removal of reservoirs could result in loss of reservoir wetlands.	2, 3, 5	S (long term)	TER-5: Permanent Loss of Wetlands at Reservoirs	LTS (long term)
Construction activities could result in the removal of trees and other vegetation and could result in long-term impacts on wildlife habitat, particularly for nesting birds.	2, 3, 4, 5	LTS (long term)	TER-1: Habitat Rehabilitation Plan TER-2: Nesting Bird Surveys TER-3: Bald and Golden Eagle Surveys	LTS (long term)
Removal of dam facilities could result in long-term impacts on bats from loss of roosting habitat.	2, 3, 5	S (long term)	TER-6: Impacts on Special-Status Bats from Loss of Roosting Habitat	LTS (long term)
Dam removal and the flushing of sediments could result in long-term impacts on amphibians from changes in habitat due to sedimentation in downstream reaches.	2, 3, 5	LTS (long term)	None	LTS (long term)
Removal of the reservoirs could result in long-term impacts on special-status species from loss of aquatic habitat at reservoirs.	2, 3, 5	LTS (long term) Special Status Birds LTS (long term) Special-status plants at the reservoirs	TER-2: Nesting Bird Surveys TER-3: Bald and Golden Eagle TER-4: Surveys for Special Status Plants	LTS (long term)
Dam removal and associated sedimentation in downstream reaches could result in impacts on culturally important species.	2, 3, 5	LTS (short term)	None	LTS (short term)
Removal of reservoirs and associated facilities could result in long-term impacts on wildlife corridors.	2	B (long term)	None	B (long term)
Continued existence of the reservoirs and/or other facilities could present a barrier to movement of some terrestrial species.	1, 3, 4, 5	NCFEC	None	NCFEC
Exposed reservoir bottoms and other areas of construction disturbance could result in impacts from invasive plants.	2, 3, 4, 5	LTS (short term)	TER-1: Habitat Rehabilitation Plan	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of various recreation facilities could result in impacts to terrestrial resources during construction.	2, 3, 5	LTS (short term)	TER-1: Habitat Rehabilitation Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special Status Plants TER-4: Surveys for Special Status Plants	LTS (short term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could cause impacts to terrestrial resources.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities - Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could cause adverse effects to terrestrial resources.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation - Programmatic Measure</i>				
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could result in impacts on terrestrial resources from construction activities and pipe alignment.	2, 3, 5	LTS (short term)	TER-1: Habitat Rehabilitation Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special Status Plants TER-4: Surveys for Special Status Plants	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>KBRA - Programmatic Measures</i>				
Construction activities associated with the Fisheries Restoration Plan- Phase I and Phase II could result in impacts on terrestrial wildlife and/or habitat.	2,3	S (short term)	TER-1: Habitat Rehabilitation Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special-Status Plants TER-4: Permanent Loss of Wetlands at Reservoirs	LTS (short term)
Construction activities associated with Fish Entrainment Reduction could result in impacts on terrestrial wildlife and/or habitat	2,3	S (short term)	TER-1: Habitat Rehabilitation Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special-Status Plants TER-4: Permanent Loss of Wetlands at Reservoirs	LTS (short term)
Modification of aquatic habitat from the Wood River Wetland Restoration project could result in impacts on terrestrial wildlife and/or habitat.	2,3	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The Water Diversion Limitations, On-Project Plan, WURP, and Interim Flow and Lake Level Programs could result in impacts on terrestrial wildlife and/or habitat.	2,3	B – (long term) Lower Klamath NWR, Tule Lake NWR	TER-2: Nesting Bird Surveys	B (long term)
		LTS – (long term) Upper Klamath NWR (waterfowl and non-game waterbirds) S – (long term) Upper Klamath NWR (juniper removal actions and effects on terrestrial wildlife including nesting migratory birds)		LTS (long term)
The Mazama Forest Project could result in adverse impacts on terrestrial resources.	2,3	NCFEC	None	NCFEC
3.6 Flood Hydrology				
Continued operation of the Klamath Hydroelectric Project and Reclamation's Klamath Project could alter river flows and result in changes to flood risks.	1	NCFEC	None	NCFEC
Ongoing restoration actions could affect flood hydrology.	1	NCFEC	None	NCFEC
Dam failure could inundate areas in the downstream watershed.	1	LTS (long term)	None	LTS (long term)
Drawdown of reservoirs could result in short-term increases in downstream surface water flows and could result in changes to flood risk.	2, 3, 5	LTS (short term)	None	LTS (short term)
Reservoir drawdown and resulting downstream sediment deposition could change flood risk.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Changes in flows following dam removal could result in changes to the 100-year floodplain downstream from Iron Gate Dam between River Mile 190 and 171.	2, 3, 5	S (long term)	H-1: Emergency Response Plan H -2: Move or Relocate Structures	LTS (long term)
Removing the Four Facilities could reduce the risks associated with a dam failure.	2	B (long term)	None	B (long term)
Removing Copco 1 and Iron Gate Dams could reduce the risks associated with a dam failure.	5	B (long term)	None	B (long term)
Removal of recreation facilities located on the banks of the existing reservoirs which could affect flood hydrology.	2, 3, 5	NCFEC	None	NCFEC
Changes in flows in the Hydroelectric Reach including the J.C. Boyle and Copco 2 Bypass Reaches could affect flood hydrology.	4, 5	LTS (long term)	None	LTS (long term)
Construction of a new gage within the 100-year floodplain at Copco 2 Dam or J.C. Boyle Dam to measure flows could affect flood hydrology.	5	LTS (long term)	None	LTS (long term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could cause changes to operations affecting flows downstream from Keno Dam, which could cause changes to flood risks.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities - Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could cause changed in flood risk downstream from the facilities.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could affect flood risk.	2, 3, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>KBRA - Programmatic Measures</i>				
Implementation of the Fisheries Restoration Plans could change flows downstream from Upper Klamath Lake, which could result in changes to flood risks	2, 3	LTS (long term)	None	LTS (long term)
Implementation of Wood River Wetland Restoration by the Bureau of Land Management may change flows upstream and downstream from Upper Klamath Lake, which could result in changes to flood risks.	2, 3	B (long term)	None	B (long term)
Implementation of Future Storage Opportunities by Reclamation may cause changes to flows upstream and down downstream from Upper Klamath Lake, which could result in changes to flood risks	2, 3	B (long term)	None	B (long term)
Implementation of the On-Project Plan may change flows downstream from Upper Klamath Lake during dry years, which could result in changes to flood risks.	2, 3	NCFEC	None	NCFEC
Implementation of the WURP would change flows upstream of Upper Klamath Lake, which could result in changes to flood risks.	2, 3	NCFEC	None	NCFEC
Implementation of an Emergency Response Plan could result in changes to flood risks in the event of failure to a Klamath Reclamation Project facility or dike on Upper Klamath Lake or Lake Ewauna.	2, 3	NCFEC	None	NCFEC
Implementation of Climate Change Assessment and Adaptive Management may change flows upstream and downstream from Upper Klamath Lake, which could result in changes to flood risks.	2, 3	B (long term)	None	B (long term)
Implementation of Interim Flow and Lake Program during the interim period would change river flows, which could result in changes to flood risks.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.7 Ground Water				
Continued impoundment of water in the reservoirs with no changes in facility operations could result in impacts on ground water resources in the vicinity of the reservoirs.	1, 4	NCFEC	None	NCFEC
Continued impoundment of the water in the reservoirs could lead to increased ground water storage.	1, 4, 5	B (long term)	None	B (long term)
Draining of the reservoirs could lower ground water levels in the aquifer adjacent to the reservoirs, which could impact existing wells.	2, 3, 5	S (long term)	GW-1: Deepening or Replacement of an Existing Affected Ground Water Well	LTS (long term)
Removing the dams and eliminating the reservoirs could reduce ground water discharge to the Klamath River.	2, 3, 5	LTS (long term)	None	LTS (long term)
Dam removal activities would include the demolition of various recreation facilities which could affect ground water.	2, 3, 5	NCFEC	None	NCFEC
Keno Transfer				
Implementation of the Keno Transfer could cause adverse effects to local ground water.	2, 3	NCFEC	None	NCFEC
East and Westside Facilities – Programmatic Measure				
Decommissioning the East and Westside Facilities could have adverse effects to ground water resources.	2, 3	NCFEC	None	NCFEC
City of Yreka Water Supply Pipeline Relocation – Programmatic Measure				
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could affect ground water.	2, 3, 5	NCFEC	None	NCFEC
KBRA – Programmatic Measures				
The Water Diversion Limitations program could reduce irrigation water in the driest years.	2,3	B (long term)	None	B (long term)
Upland vegetation management under the WURP would increase inflow to Upper Klamath Lake.	2,3	B (long term)	None	B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The purchase and lease of water under the Interim Flow and Lake Level Program would increase water for fisheries.	2,3	LTS (short term) B (long term)	None	LTS (short term) B (long term)
Implementation of an Emergency Response Plan could result in changes to ground water following the failure of a Klamath Reclamation Project facility or dike on Upper Klamath Lake or Lake Ewauna.	2,3	NCFEC – ground water resources B (long term) – reduction in ground water use	None	NCFEC - ground water resources B (long term) – reduction in ground water use
3.8 Water Supply/Water Rights				
Continued operation of the Four Facilities could affect water supply operations.	1, 4	NCFEC	None	NCFEC
Ongoing restoration actions would continue to be implemented and could affect water supply availability.	1	NCFEC	None	NCFEC
Removal of various recreation facilities located on the banks of the existing reservoirs which could affect water supply or water rights.	2, 3, 5	NCFEC	None	NCFEC
Flow changes downstream from Iron Gate Dam could affect water supply downstream from Seiad Valley.	2, 3, 5	LTS (long term)	None	LTS (long term)
Changes in flow downstream from Iron Gate Dam could affect water rights holders.	2, 3, 5	LTS (long term)	None	LTS (long term)
Sediment release during reservoir drawdown could affect Klamath River geomorphology and water intake pumps downstream from Iron Gate Dam.	2, 3, 5	S (short term)	WRWS-1: Modifications to Intake Points	LTS (short term)
Keno Transfer				
Implementation of the Keno Transfer could cause changes to operations affecting water levels upstream of Keno Dam, which could cause changes to water supply or water rights.	2, 3	NCFEC	None	NCFEC
East and Westside Facilities – Programmatic Measure				

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Decommissioning of the East and Westside Facilities and redirecting of water flows could affect water users reliant on a diversion from the West Canal.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could affect water supply.	2, 3, 5	NCFEC	None	NCFEC
<i>KBRA – Programmatic Measures</i>				
Implementation of the trap and haul element of the Fisheries Reintroduction and Management would require water rights to divert water for the fish handling facilities.	2, 3	LTS (long term)	None	LTS (long term)
Implementation of Wood River Wetland Restoration by the Bureau of Land Management would result in changes to storage opportunities at Agency Lake, which could affect water supply.	2, 3	LTS (long term)	None	LTS (long term)
Implementation of Water Diversion Limitations to Reclamation’s Klamath Project could result in changes to water diversions, which may affect water rights and water supply.	2, 3	LTS (long term)	None	LTS (long term)
Implementation of the On-Project Plan to allow for full implementation of Water Diversion Limitations to Reclamation’s Klamath Project would result in changes to water diversions for irrigation in dry years, which could affect water rights or adjudicated rights.	2, 3	B (long term)	None	B (long term)
The study of additional off-stream storage opportunities in the Upper Klamath Basin to identify new storage opportunities, could affect water supply.	2, 3	NCFEC	None	NCFEC
Implementation of the Water Use Retirement Program increases instream flow to Upper Klamath Lake which could affect water rights upstream of Upper Klamath Lake.	2, 3	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Water Use Retirement Program increases instream flow to Upper Klamath Lake which could affect water supply upstream of Upper Klamath Lake.	2, 3	NCFEC	None	NCFEC
Implementation of Off-Project Water Settlement negotiations could affect water rights and adjudicated rights upstream of Upper Klamath Lake.	2, 3	B (long term) resolved water rights	None	B (long term) resolved water rights
	2, 3	LTS (long term) unresolved water rights	None	LTS (long term) unresolved water rights
Implementation of Off-Project Reliance Program could change water deliveries for irrigation downstream from Upper Klamath Lake to Off-Project water users affecting water rights.	2, 3	LTS (long term)	None	LTS (long term)
Implementation of an Emergency Response Plan could result in a change to water supply deliveries in the event of failure to a Klamath Reclamation Project facility or dike on Upper Klamath Lake or Lake Ewauna.	2, 3	B (long term)	None	B (long term)
Implementation of Climate Change Assessment and Adaptive Management could result in changes to water deliveries depending on climatic changes.	2, 3	B (long term)	None	B (long term)
Implementation of Interim Flow and Lake Program during the interim period could change water deliveries affecting water supply.	2, 3	LTS (long term)	None	LTS (long term)
Implementation of Drought Plan water and resource management actions could result in changes to water supply deliveries for Klamath Basin interests during drought years.	2, 3	B (long term)	None	B (long term)
<i>Trap and Haul – Programmatic Measure</i>				
Implementation of the trap and haul measures could require water rights to divert water for the fish handling facilities.	4, 5	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.9 Air Quality				
Vehicle exhaust and fugitive dust emissions from dam removal activities and construction of fish passage could increase emissions of VOC, NO _x , CO, SO ₂ , PM ₁₀ , and PM _{2.5} to levels that could exceed Siskiyou County's thresholds of significance.	1	Not quantified ^b	None	None
	2, 3, 5	S (short term)	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks AQ-4: Dust control measures during blasting operations	S (short term)
	4	LTS (short term)	None	LTS (short term)
Reservoir restoration actions could result in short-term and temporary increases in criteria pollutant emissions from the use of helicopters, trucks, and barges that could exceed Siskiyou County's thresholds of significance.	2, 3, 5	LTS (short term)	None	LTS (short term)
Relocation and demolition of various recreation facilities could result in short-term and temporary increases in criteria pollutant emissions from the operation of construction equipment that could exceed Siskiyou County's thresholds of significance.	2, 3, 5	LTS (short term)	None	LTS (short term)
Vehicle exhaust and fugitive dust emissions from demolition activities exceed the de minimus thresholds in 40 CFR 93.153 that would require the development of a general conformity determination.	2, 3, 4, 5	General Conformity Determination not required	None	None
Fugitive dust emissions from demolition activities could impair visibility in Federal Class I areas.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Activities associated with interim measure (IM) 7 J.C. Boyle Gravel Placement and/or Habitat Enhancement, could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	1,2,3	LTS (short term)	None	LTS (short term)
Activities associated with interim measure (IM) 8 J.C. Boyle Bypass Barrier Removal could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	1	LTS (short term)	None	LTS (short term)
Activities associated with interim measure (IM) 16 Water Diversions could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	2,3	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could have adverse effects on air quality.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could cause adverse air quality effects.	2, 3	LTS (long term)	None	LTS (long term)
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Relocation of the City of Yreka Water Supply Pipeline could result in short-term and temporary increases in criteria pollutant emissions from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>KBRA – Programmatic Measures</i>				
Construction activities associated with the KBRA programs could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust.	2, 3	S (short term)	AQ-1: Model Year 2015 or newer engines for Off-Road Construction Equipment AQ-2: Model Year 2000 or newer engines for On-Road Construction Equipment AQ:3 Model Year 2010 or newer engines for On-Road Heavy Duty Vehicles	S ⁹ (short term)
Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in air quality pollutant emissions from vehicle exhaust associated with trap and haul activities.	2, 3	S (short term)	AQ-1: Model Year 2015 or newer engines for Off-Road Construction Equipment AQ-2: Model Year 2000 or newer engines for On-Road Construction Equipment AQ:3 Model Year 2010 or newer engines for On-Road Heavy Duty Vehicles	S ⁹ (short term)
<i>Trap and Haul Operations – Programmatic Measure</i>				
Implementation of trap and haul measures could result in temporary increases in air quality pollutant emissions from vehicle exhaust.	4, 5	S (short term)	AQ-1: Model Year 2015 or newer engines for Off-Road Construction Equipment AQ-2: Model Year 2000 or newer engines for On-Road Construction Equipment AQ:3 Model Year 2010 or newer engines for On-Road Heavy Duty Vehicles	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.10 Greenhouse Gases/Global Climate Change				
Vehicle exhaust from dam removal activities and construction of fish passage could increase GHG emissions in the short term to levels that could exceed the designated significance criteria.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Reservoir restoration actions could result in short-term increases in GHG emissions from the use of helicopters, trucks, and barges.	1, 2, 3, 5	LTS (short term)	None	LTS (short term)
Removing or reducing a renewable source of power by removing the dams or developing fish passage could result in increased GHG emissions from possible non-renewable alternate sources of power.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	S (long term)	CC-1 - Market Mechanisms CC-2 - Energy Audit Program CC-3 - Energy Conservation Plan	S (long term)
The demolition of various recreation facilities which could result in short-term increases in GHG emissions from vehicle exhaust.	2, 3, 5	LTS (short term)	None	LTS (short-term)
Activities associated with interim measures (IM) 7 J.C. Boyle Gravel Placement and/or Habitat Enhancement could result in short-term and temporary increases in GHG emissions from vehicle exhaust.	1,2,3	LTS (short term)	None	LTS (short term)
Activities associated with interim measures (IM) 8 J.C. Boyle Bypass Barrier Removal could result in short-term and temporary increases in GHG emissions from vehicle exhaust.	1	LTS (short term)	None	LTS (short term)
Activities associated with interim measures (IM) 16 Water Divisions could result in short-term and temporary increases in GHG emissions from vehicle exhaust.	2,3	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>Trap and Haul Operations – Programmatic Measure</i>				
Implementation of trap and haul measures could result in temporary increases in GHG emissions from vehicle exhaust	4,5	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could have adverse effects on greenhouse gases and climate change.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
Decommissioning the East and Westside Facilities could cause adverse greenhouse gas and climate change effects.	2, 3	LTS (long term)	None	LTS (long term)
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Relocation of the City of Yreka Water Supply Pipeline could result in short-term increases in GHG emissions from vehicle exhaust.	2, 3, 5	LTS (short term)	None	LTS (short term)
<i>KBRA – Programmatic Measures</i>				
Construction activities associated with the KBRA programs involving construction could cause temporary increases in GHG emissions and climate change.	2, 3	LTS (short term)	None	LTS (short term)
Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in GHG emissions from vehicle exhaust associated with trap and haul activities.	2, 3	LTS (short term)	None	LTS (short term)
Implementation of the Power for Water Management Program of the KBRA could create new renewable energy sources which would provide affordable electricity to allow efficient use, distribution, and management of water.	2, 3	B (long term)	None	B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Drought Plan and the Climate Change Assessment and Adaptive Management Plan could affect climate change-related impacts.	2, 3	B (long term)	None	B (long term)
3.11 Geology, Soils, and Geologic Hazards				
Continued impoundment of water in the reservoirs could continue to trap sediment at rates similar to historical rates.	1, 4	NCFEC	None	NCFEC
Continued impoundment of water in the reservoirs could continue to prevent access to the diatomite beds at Copco 1 Reservoir.	1, 4	NCFEC	None	NCFEC
Draining of the reservoirs could uncover diatomite beds at Copco 1 Reservoir; however the land would be transferred to a State agency which would not allow commercial use, access to the mineral resource would not be changed.	2, 3, 5	NCFEC	None	NCFEC
Construction and deconstruction activities could change erosion patterns through heavy vehicle use, excavation, and grading which could result in soil erosion.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Draining of the reservoirs could cause instability along the banks of the reservoirs.	2, 3, 5	LTS (short term)	None	LTS (short term)
Draining of Copco 1 Reservoir could eliminate wave induced erosion thereby improving stability for upland hillsides and reducing the potential for erosion.	2, 3, 5	LTS (long term)	None	LTS (long term)
Draining of the reservoirs could cause river bank erosion downstream.	2, 3, 5	LTS (short term)	None	LTS (short term)
Draining of the reservoirs could result in short-term increases in sedimentation in slow-moving eddies and pools downstream from the reservoirs to the Klamath River estuary.	2, 3, 5	LTS (short term)	None	LTS (short term)
Draining of the reservoirs could result in changes to seismic or volcanic activity.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Draining of the reservoirs could result in long-term changes in the amount of erosion of the exposed reservoir bottom sediment remaining in the river channel.	2, 3, 5	LTS (long term)	None	LTS (long term)
Draining of the reservoirs could result in long-term changes to downstream sediment deposition from the erosion of remaining reservoir sediments.	2, 3, 5	LTS (long term)	None	LTS (long term)
Draining of the reservoirs could leave sediments that would dry out and could affect restoration activities and/or future road construction activities.	2, 3, 5	S (long term)	GEO-1: Geotechnical Analysis	LTS (long term)
Dam removal activities would include the removal of various recreation facilities which could affect geology and soils.	2, 3, 5	NCFEC	None	NCFEC
<i>Keno Transfer</i>				
The Keno Transfer could have adverse effects to geology, soils, or geologic hazards.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could have adverse effects to geology, soils, or geologic hazards.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could affect geology and soils.	2, 3,5	NCFEC	None	NCFEC
<i>KBRA – Programmatic Measures</i>				
Implementation of the Phase I Fisheries Restoration Plan could result in construction related sediment erosion.	2, 3	LTS (short term) B (long term)	None	LTS (short term) B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.13 Cultural and Historic Resources				
Under the No Action/No Project Alternative current effects/impacts on historic properties/ historical resources, other cultural resources, and human remains will continue to occur.	1, 4	NCFEC	None	NCFEC
Dam removal and construction of fish passage facilities could result in direct effects/impacts to J.C. Boyle Dam, Copco 1 Dam, Copco 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and on the KHHD, which is considered eligible for inclusion on the National Register and California Register.	2, 3, 4, 5	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	S (long term)
Reservoir drawdown associated with dam removal could affect/impact archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3, 5	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities including use of haul roads and disposal sites for demolition debris could affect/impact archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register or California Register.	2, 3, 4, 5	S (short term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	LTS (short term)
Removal of the recreational facilities after reservoir drawdown may affect archaeological or historic sites that could be eligible for inclusion on the National Register or California Register or human remains.	2, 3	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	LTS (long term)
<i>Keno Transfer</i>				
The Transfer of Keno Dam to the DOI could have adverse effects to historic properties or historic resources.	2, 3	B (long term)	None	B (long term)
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could have adverse effects on historic resources or historic properties.	2, 3	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Installation of the Yreka Water Supply Pipeline could affect/impact archaeological and historic sites that are eligible for inclusion on the National Register or California Register.	2, 3	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	LTS (long term)
<i>KBRA – Programmatic Measures</i>				
Implementation of the KBRA programs including the Phase 1 and 2 Fisheries Restoration Plans, Fisheries Reintroduction and Management Plan, Wood River Wetland Restoration Project, On-Project Plan, Water Use Retirement Program, Fish Entrainment Reduction, Klamath Tribes Interim Fishing Site, and Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	S ¹⁰ (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Establishment of the Klamath Tribes Interim Fishing Site and implementation of the Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	LTS (long term)
Implementation of the Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and possibly Indian human remains.	2, 3	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	LTS (long term)
3.14 Land Use, Agricultural and Forest Resources				
The continued operation of and impoundment of water at the Four Facilities could conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.	1	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The exposure of the currently inundated lands from the removal of the Four Facilities could conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.	2, 3	NCFEC	None	NCFEC
The construction of fish passage infrastructure at the Four Facilities, or the construction activities associated with the removal of Copco 1 and Iron Gate dams and the construction of fish passage infrastructure at J.C. Boyle and Copco 2 could conflict with applicable land use plans, policies, or regulations adopted for the purpose of mitigating an environmental effect.	4, 5	NCFEC	None	NCFEC
Both the continued impoundment of water at the Four Facilities and dam removal could result in the direct conversion of farmland to non-agricultural use or conflict with the Williamson Act or agricultural zoning in the Upper Klamath Basin.	1, 2, 3, 4, 5	NCFEC	None	NCFEC
Both the continued impoundment of water at the Four Facilities and dam removal could result in the direct conversion of forest lands to non-forest use or conflict with forest zoning.	1, 2, 4, 3, 5	NCFEC	None	NCFEC
Continued impoundment of water at the Four Facilities could indirectly convert farmland to non-agricultural use or forest land to non-forest use.	1, 4	NCFEC	None	NCFEC
Ongoing restoration actions could affect land use, agriculture, and forest resources.	1, 4	NCFEC	None	NCFEC
Construction activities including the creation of temporary roads, staging areas and construction sites during dam removal could result in the conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The construction of fish passage infrastructure at the Four Facilities, or the construction activities associated with the removal of Copco 1 and Iron Gate dams and the construction of fish passage infrastructure at J.C. Boyle and Copco 2, could result in the indirect conversion of farmland to non-agricultural use or conflict with the Williamson Act or agricultural zoning in the Upper Klamath Basin due to uncertain water supplies.	4, 5	NCFEC	None	NCFEC
Construction activities associated with dam removal could require new, permanent roads to be constructed to provide access to new recreation areas, which could constitute a change in the existing environment.	2, 3, 5	LTS (short term)	None	LTS (short term)
Removal of recreational facilities currently located on the banks of the existing reservoirs could change land use classification.	2, 3	NCFEC	None	NCFEC
The construction and development of fish passage facilities would require new permanent roads to be created to provide access to the Klamath Hydroelectric Project facilities which could change land use and create conflicts with applicable plans and policies or otherwise cause a significant land use impact due to existing zoning and land uses.	4, 5	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
The transfer of ownership of Keno Dam from PacifiCorp to Reclamation could result in a change in land use.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could impact land use.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Dam removal would require the relocation of the Yreka water supply line and could result in a change in the existing environment and surrounding environment.	2, 3, 5	NCFEC	None	NCFEC
<i>KBRA – Programmatic Measures</i>				
The Fisheries Reintroduction and Management Plan and the construction of fish handling facilities for trap and haul operations could conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.	2,3	LTS (long term)	None	LTS (long term)
The implementation of the Water Diversion Limitation Program could convert farmland to non-agricultural uses.	2,3	LTS (long term)	None	LTS (long term)
The Water Use Retirement Program could result in the fallowing or conversion of agricultural land to non-agricultural uses, such as open space or wetland restoration areas	2,3	B	None	B
The Power for Water Management Program could affect land use in the Klamath Hydroelectric Project area.	2,3	LTS (long term)	None	LTS (long term)
The KBRA's Mazama Forest Project could result in the conversion of forest land to non-forest use or conflict with forest zoning.	2,3	NCFEC	None	NCFEC
<i>Trap and Haul – Programmatic Measure</i>				
Construction of fish handling facilities for trap and haul operations could change land use.	4, 5	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.17 Population and Housing				
Construction activities could employ non-local workers, who would need housing for the duration of their employment.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction, restoration, and monitoring activities associated with new programs could create new jobs and could employ non-local workers, who would need housing for the duration of their employment.	1	LTS (short term)	None	LTS (short term)
Removal of recreation facilities and related construction activities could result in an increase in construction workers requiring housing.	2, 3, 5	NCFEC	None	NCFEC
<i>Keno Transfer</i>				
The transfer of ownership of Keno Dam from PacifiCorp to Reclamation could affect population and housing.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could impact population and housing.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Dam removal would require relocation of the Yreka Water Supply Pipeline and could result in an increase in construction workers requiring housing.	2, 3, 5	NCFEC	None	NCFEC
<i>KBRA – Programmatic Measures</i>				
Construction and monitoring activities associated with the KBRA programs could employ non-local workers who would need housing for the duration of their employment.	2,3	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.18 Public Health and Safety, Utilities and Public Services, Solid Waste, Power				
Continued impoundment of water at the reservoirs under annual license renewals would allow hydropower generation to continue subject to the conditions of the Reclamation Biological Opinions, which would have the potential to decrease hydropower production.	1	NCFEC	None	NCFEC
Construction activities related to the ongoing restoration and management activities could impact public health and safety.	1	NCFEC	None	NCFEC
Construction activities from dam removal and fish passage facilities could result in public health and safety risks.	2, 3, 4, 5	S (short term)	PHS-1: Public Safety Management Plan	LTS (short term)
Construction activities could increase public hazards by placing construction equipment in waterways, roadways, and other areas accessible by residents, recreational visitors, and potential spectators of the deconstruction activities.	2, 3, 4, 5	S (short term)	PHS-1: Public Safety Management Plan PHS-2: Fire Management Plan	LTS (short term)
Construction activities could increase the risk of wildfires.	2, 3, 4, 5	S (short term)	PHS-2: Fire Management Plan	LTS (short term)
Dam removal could eliminate a water source for wildfire services and could increase response times.	2, 3, 5	LTS (long term)	None	LTS (long term)
Dam removal would eliminate a water source for residential firefighting in and around Copco Village, and could increase the risk to homes from fire.	2, 3, 5	LTS (long term)	None	LTS (long term)
Construction activities could affect police services by temporarily increasing the population of construction workers, lengthening response times due to construction traffic on area roads, and exposing construction areas to theft and/or vandalism.	2, 3, 4, 5	NCFEC	None	NCFEC
Construction activities could require the use of electricity and natural gas supplies in the study area.	2, 3, 4, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The removal of recreational facilities currently located on the banks of the existing reservoirs could affect public health and safety.	2, 3, 5	S (long term)	PS-1: Public Safety Management Plan PHS-2: Fire Management Plan	LTS (long term)
Construction activities could affect public services and utilities in the counties and cities in the study area.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities could result in the need for new temporary access roads.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities (including Signage and Construction Traffic Management BMP) could affect road conditions by increasing traffic from heavy construction vehicles which could affect public health and safety.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities could generate a substantial amount of solid waste which could affect public services and utilities.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Dam removal would remove existing hydropower facilities, resulting in a loss of hydropower generation which could affect the supply of electricity.	2, 3, 5	LTS (long term)	None	LTS (long term)
Development of fish passage would reduce power generation at the existing hydropower facilities due to bypass stream flow requirements which could affect the supply of electricity.	4, 5	LTS (long term)	None	LTS (long term)
Dam removal could increase available mosquito habitat and could increase the risk of disease transmission in the short term.	2, 3, 5	LTS (short term)	None	LTS (short term)
Leaving dam facilities and infrastructure in place could have the potential to result in public health and safety risks.	4	NCFEC	None	NCFEC
	3, 5	LTS (long term)	None	LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>Keno Transfer</i>				
Under the Proposed Action, the Keno Facility will be transferred to the DOI, which could cause adverse effects to Public Health and Safety.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
Under the Proposed Action, the East and Westside Facilities will be decommissioned, resulting in the loss of generated power.	2, 3	LTS (long term)	None	LTS (long term)
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
Construction activities could affect the City of Yreka's municipal water supply by damaging or exposing the Yreka Water Supply Pipeline prior to its relocation.	2, 3, 5	LTS (short term)	None	LTS (short term)
The proposed above-ground location of the Yreka Water Supply Pipeline could increase the risk of vandalism to the pipeline.	2, 3, 5	LTS (long term)	None	LTS (long term)
<i>KBRA – Programmatic Measures</i>				
Prescribed burning and mechanical thinning under the Phase I and II Fisheries Restoration Plans could affect Public Services and Utilities.	2, 3	S (short term); B (long term)	PHS-2: Fire Management Plan	LTS (short term); B (long term)
Construction activities associated with the KBRA programs could result in public health and safety impacts.	2, 3	B (long term)	None	B (long term)
Implementation of the Power for Water Management Program could create new renewable energy sources.	2, 3	B (long term)	None	B (long term)
Completing the Emergency Response Plan could have beneficial effects on Public Services and Public Safety.	2, 3	B (long term)	None	B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.19 Scenic Quality				
Continued impoundment of water at the Four Facilities could result in water quality impacts that could have long-term impacts on scenic quality.	1, 4	NCFEC	None	NCFEC
Continued existence of the buildings and other man-made structures could have the impact that they would remain inconsistent with the VRM classification of the surrounding area (where such inconsistency is defined as a criterion of significance).	1, 3, 4, 5	NCFEC	None	NCFEC
Ongoing fish habitat restoration actions could result in short-term and long-term impacts on scenic resources.	1	S (short term from construction); B (long term)	None	S (short term from construction); B (long term)
Dam removal could result in impacts on scenic resources from removal of dams and facilities.	2, 3, 5	B (long term)	None	B (long term)
The removal of historic properties could result in short-term and long-term impacts on scenic resources.	2, 3, 5	S (short term and long term)	None	S (long term)
Dam removal could result in short-term and long-term impacts on scenic resources in formerly inundated reservoir areas.	2, 3, 5	S (short term and long term)	None	S (short term and long term)
Deconstruction and restoration activities could result in short-term impacts on scenic resources in the immediate vicinity of the Four Facilities.	2, 3, 5	S (short term); B (long term)	None	S (short term); B (long term)
Replacement of the existing wooden Lakeview Bridge just downstream from Iron Gate Dam with a concrete bridge could result in short-term and long-term impacts on scenic resources.	2, 3	S (short term); LTS (long term)	None	S (short term); LTS (long term)
Demolition of existing recreation facilities, such as campgrounds and boat ramps, from the reservoir banks to the new river shoreline would result in short-term and long-term impacts on scenic resources.	2, 3	S (short term); LTS (long term)	None	S (short term); LTS (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Deconstruction activities could create a new source of light or glare that could adversely affect nighttime views in the area.	2, 3, 4, 5	S (short term)	SQ-1: Measures to Reduce Nighttime Light and Glare	LTS (short term)
Sediment release during dam and reservoir removal could cause temporary changes in water quality and the appearance of the Klamath River in the area of the dams and downstream from Iron Gate Dam.	2, 3, 5	S (short term)	None	S (short term)
Removal of the dams and facilities could result in long-term impacts on scenic resources from changes to water quality.	2, 3, 5	B (long term)	None	B (long term)
Demolition, construction, and restoration activities for the fishways could cause short-term adverse effects on the scenic vistas in the immediate vicinity of the Four Facilities.	4, 5	S (short term)	None	S (short term)
Construction of fishways could cause changes in the appearance of the Klamath River in the area of the dams and downstream from Iron Gate Dam.	4, 5	LTS (short term)	None	LTS (short term)
Fishways could cause substantial long-term impacts on scenic resources.	4, 5	S (long term)	SQ-1: Measures to Minimize Scenery Disturbances	S (long term)
<i>Keno Transfer</i>				
Implementation of the Keno Transfer could affect scenic resources.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
Decommissioning of the East and Westside canals and hydropower facilities could affect scenic resources.	2, 3	LTS (long term)	None	LTS (long term)
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measures</i>				
Construction of a new, elevated City of Yreka Water Supply Pipeline and steel pipeline bridge to support the pipe above the river could result in short-term and long-term impacts on scenic resources.	2, 3, 5	S (short term and long term)	SQ-2: Measures to Minimize Scenery Disturbances	S (short term and long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>KBRA – Programmatic Measures</i>				
Construction activities associated with the Fisheries Restoration Plan- Phase I and Phase II could result in impacts on scenic resources.	2, 3	LTS (short term)	None	LTS (short term)
The Fisheries Restoration Plan- Phase I and Phase II could result in long-term impacts on scenic resources.	2, 3	B (long term)	None	B (long term)
The Wood River Wetland Restoration Project could result in long-term impacts on scenic resources.	2, 3	LTS (long term)	None	LTS (long term)
Construction activities associated with the WURP could result in impacts on scenic resources.	2, 3	LTS (short term)	None	LTS (short term)
The Water Diversion Limitations, On-Project Plan, WURP, and Interim Flow and Lake Level Programs could result in long-term impacts on scenic resources.	2, 3	LTS (short term)	None	LTS (short term)
Fish Entrainment Reduction could result in short-term and long-term impacts on scenic resources.	2, 3	LTS (short term and long term)	None	LTS (short term and long term)
Construction activities associated with the Klamath Tribes Interim Fish Site could result in impacts on scenic resources.	2, 3	LTS (short term)	None	LTS (short term)
The Klamath Tribes Interim Fish Site could result in long-term impacts on scenic resources.	2, 3	LTS (long term)	None	LTS (long term)
Construction of fish management structures would introduce new features into the landscape.	2, 3	S (long term)	SQ-2: Measures to Minimize Scenery Disturbances	S (long term)
<i>Trap and Haul – Programmatic Measure</i>				
Construction activities associated with fish collection facilities would introduce new features into the landscape.	4, 5	LTS (short term); S (long term)	SQ-2: Measures to Minimize Scenery Disturbances	LTS (short term); S (long term)
3.20 Recreation				
Continued existence of the reservoirs could change existing recreation access and opportunities.	1,4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities associated with ongoing programs could temporarily restrict access to recreational opportunities.	1	LTS (short term)	None	LTS (short term)
Construction activities associated with ongoing programs could result in short-term water quality impacts that could affect recreational opportunities.	1	LTS (short term)	None	LTS (short term)
Ongoing actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin.	1	B (long term)	None	B (long term)
Construction activities could temporarily restrict recreational access on and in the vicinity of the reservoirs.	1, 4	NCFEC	None	NCFEC
	2, 3, 5	LTS (short term)	None	LTS (short term)
Construction activities, such as demolition, would generate temporary impacts (i.e., increased noise and dust) and could decrease the quality of recreational experiences in the vicinity of the reservoirs.	2, 3, 5	LTS (short term)	None	LTS (short term)
Reservoir removal could permanently decrease the availability of reservoir/lake-based recreational opportunities.	1, 4	NCFEC	None	NCFEC
	2, 3, 5	LTS (long term)	None	LTS (long term)
Removal of recreation facilities could limit access to recreational opportunities along and within the newly formed river channel.	2, 3, 5	S (long term)	REC-1: Prepare a plan to develop new recreational facilities and river access points	LTS (long term)
Changes in flow and water quality following dam removal could impact developed recreational facilities upstream and downstream from the reservoirs.	2, 3, 5	LTS (long term)	None	LTS (long term)
Downstream sediment release during reservoir drawdown could decrease the quality of water-contact-based-recreation in the short term.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of impoundments and associated improvements in water quality and could impact water-contact-based recreational opportunities.	2, 3, 5	B (long term)	None	B (long term)
	1, 4	NCFEC	None	NCFEC
Changes to the floodplain or river channel and removal of recreation facilities as a result of dam removal could affect access to whitewater boating opportunities.	2, 3, 5	NCFEC - downstream from Iron Gate LTS - (short term) Hydroelectric Reach	None	NCFEC - downstream from Iron Gate LTS - (short term) Hydroelectric Reach
Changes in flows following dam removal could increase the number of days with acceptable flows for whitewater boating and recreational fishing activities in the Keno Reach and reaches downstream from Iron Gate Dam.	2, 3, 5	LTS (long term)	None	LTS (long term)
Changes in flows could increase the number of days with acceptable flows for whitewater boating and recreational fishing in the J.C. Boyle and Copco 2 Bypass Reaches.	2, 3, 5	B (long term)	None	B (long term)
Changes in flows could decrease the number of days with acceptable flows for whitewater boating and recreational fishing in the Hells Corner Reach.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	S (long term) whitewater boating; LTS (long term) fishing	None	S (long term) whitewater boating; LTS (long term) fishing
Loss of peaking flows in the J.C. Boyle Peaking Reach could affect whitewater boating opportunities in the Hell's Corner Reach.	4, 5	S (long term)	None	S (long term)
Improved habitat for anadromous fish species following dam removal could affect recreational fishing opportunities in the long term.	2, 3, 4, 5	B (long term)	None	B (long term)
Implementation of Mitigation Measure REC-1 could permanently reduce recreational opportunities in the Klamath Basin.	2, 3, 5	LTS (long term)	None	LTS (long term)
<i>Keno Transfer</i>				
Transfer of the Keno Facility from PacifiCorp to DOI could affect recreational opportunities.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could have adverse effects on recreational resources.	2, 3	NCFEC	None	NCFEC
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>				
The Yreka Water Supply Pipeline, currently under the Iron Gate Reservoir, would need to be relocated to avoid damage after the reservoir is removed, creating a change in existing recreational resources.	2, 3	NCFEC	None	NCFEC
<i>KBRA – Programmatic Measures</i>				
Construction activities associated with the KBRA could temporarily restrict recreational access.	2,3	LTS (short term)	None	LTS (short term)
Construction activities associated with KBRA programs could result in short-term water quality impacts which could affect recreational opportunities.	2,3	LTS (short term)	None	LTS (short term)
Fire treatment proposed in the Fisheries Restoration Plan could alter the visual setting and result in decreased recreational visitors to the Klamath Basin.	2,3	B (long term)	None	B (long term)
KBRA actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin.	2,3	B (long term)	None	B (long term)
KBRA programs resulting in long-term water quality improvements could increase recreational opportunities throughout the Klamath Basin.	2,3	B (long term)	None	B (long term)
KBRA programs that enhance terrestrial wildlife and plant resources could increase recreational opportunities throughout the Klamath Basin.	2,3	B (long term)	None	B (long term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.21 Toxic/Hazardous Materials				
Continued operation of the Four Facilities could create a hazard to the public or the environment through the transport, use, or disposal of hazardous, toxic, or radiological waste (HTRW).	1, 4, 5	NCFEC	None	NCFEC
Construction activities could create a significant hazard to the public or the environment if they are located on a site which is included on a list of hazardous materials sites.	2, 3, 4, 5	NCFEC	None	NCFEC
Construction activities could create a hazard to the public or the environment through the transport, use, or disposal of HTRW.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities could create a hazard to the public or the environment through the abatement and disposal of asbestos and lead-based paint.	2, 3, 5	LTS (short term)	None	LTS (short term)
Construction activities could create a hazard to the public or the environment through the accidental release of hazardous materials into the environment.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Removal of various recreation facilities could create a hazard to the public or the environment through the accidental release of hazardous materials into the environment.	2, 3, 5	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
The transfer of the Keno Facility to DOI could result in affects to HTRW.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could have adverse effects in terms of toxics and hazards.	2, 3	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
City of Yreka Water Supply Pipeline Relocation – Programmatic Measure				
Construction activities required to relocate the Yreka Water Supply Pipeline could create a hazard to the public or the environment through the accidental release of hazardous materials into the environment.	2, 3, 5	LTS (short term)	None	LTS (short term)
KBRA – Programmatic Measures				
Construction activities associated with the KBRA programs could create a significant hazard to the public or the environment through the transport, use, or disposal of hazardous materials encountered during construction.	2,3	LTS (short term)	None	LTS (short term)
Construction activities associated with the KBRA programs could create a significant hazard to the public or the environment through the accidental release of hazardous materials during construction activities.	2,3	LTS (short term)	None	LTS (short term)
3.22 Traffic and Transportation				
Traffic Flow Effects				
Changes in traffic volumes could affect traffic flow.	1	NCFEC	None	NCFEC
Construction activities associated with the continued implementation of ongoing restoration actions could cause temporary effects to traffic and transportation.	1	LTS ¹¹ (short term)	None	LTS (short term)
Construction vehicle trips could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction vehicle trips could result in temporary traffic flow effects on on-site roads.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction vehicle trips during removal of recreation facilities associated with dam removal could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the interim measures (IM's) 8 J.C. Boyle Bypass Barrier Removal and IM 16 Water Diversions could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	1 (IM 8)	LTS (short term)	None	LTS (short term)
	2 (IM 8 and 16)	LTS (short term)	None	LTS (short term)
Traffic Safety Effects				
Changes in traffic safety could occur.	1	NCFEC	None	NCFEC
Construction vehicle trips could cause traffic safety effects associated with the creation of dust along gravel roads.	2, 3, 5	LTS (short term)	None	LTS (short term)
Construction vehicle trips could cause traffic safety effects associated with vehicle turnouts along Copco Road, Topsy Grade/Ager-Beswick Road and OR66.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction vehicle trips could cause traffic safety effects associated with sharp curves along Copco Road and OR66.	2, 3, 5	LTS (short term)	None	LTS (short term)
Removal of recreation facilities from the banks of the existing reservoirs down slope to the new river bed could result in traffic impacts along adjacent roadways.	2	LTS (short term)	None	LTS (short term)
Implementation of the interim measures (IM's) 7 J.C. Boyle Gravel Placement could cause traffic safety effects associated with sharp turns along Copco Road and OR66.	1,2,3	LTS (short term)	None	LTS (short term)
Implementation of the interim measures (IM's) 8 J.C. Boyle Bypass Barrier Removal could cause traffic safety effects associated with sharp turns along Copco Road and OR66.	1,2,3	LTS (short term)	None	LTS (short term)
Implementation of the interim measures (IM's) 16 Water Diversions could cause traffic safety effects associated with sharp turns along Copco Road and OR66.	2,3	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Road Condition Effects				
Changes in road conditions could occur.	1	NCFEC	None	NCFEC
Increased traffic volumes from heavy construction vehicles during construction activities could degrade road conditions and exceed bridge weight capacities. As part of the development of the construction plan, an in depth analysis of bridge and road capacity and state of repair will be conducted by the dam removal entity (DRE), with remedial actions taken prior to the commencement of facility deconstruction.	2, 3, 4, 5	S (short term)	TR-1: Relocate Jenny Creek Bridge and Culverts	LTS (short term)
Public Transit Effects				
Changes in public transit could occur.	1	NCFEC	None	NCFEC
Construction vehicle trip volumes and material hauling routes could affect regional transit service.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Non-motorized Transportation Effects				
Changes in non-motorized transportation could occur.	1	NCFEC	None	NCFEC
The presence of construction vehicles along Copco and Topsy Grade/Ager-Beswick Roads could affect non-motorized transportation (i.e., bicyclists and pedestrians) due to high speeds and dust generation.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Keno Transfer				
The transfer of the Keno Facility could impact traffic and transportation.	2, 3	NCFEC	None	NCFEC
East and Westside Facilities – Programmatic Measure				
Activities associated with the decommissioning of the East and Westside Facilities could affect traffic and transportation.	2, 3	LTS (short term)	None	LTS (short term)
City of Yreka Water Supply Pipeline Relocation – Programmatic Measure				
Construction vehicle trips during the relocation of the Yreka Water Supply Pipeline could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2, 3, 5	LTS (short term)	None	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction vehicle trips during the relocation of the Yreka Water Supply Pipeline and removal of recreation facilities could cause traffic safety effects associated with sharp curves along Copco Road. The installation of signage at sharp corners would help to reduce this risk (See Appendix B).	2, 3, 5	LTS (short term)	None	LTS (short term)
<i>KBRA – Programmatic Measures</i>				
Activities associated with the KBRA actions that involve construction could cause temporary traffic effects.	2,3	LTS (short term)	None	LTS (short term)
Operational activities associated with the Fisheries Reintroduction and Management Plans could result in temporary traffic effects associated with trap-and-haul activities.	2, 3	LTS (short term)	None	LTS (short term)
<i>Trap and Haul Operations – Programmatic Measures</i>				
Traffic associated with the implementation of the prescriptions and trap and haul operations would cause traffic safety effects on OR66 and US97, access roads, and onsite roads.	4,5	LTS (short term)	None	LTS (short term)
3.23 Noise and Vibration				
Construction and deconstruction activities at the dam sites could cause a temporary increase in noise levels at Copco 1 Dam that could affect residents in the area.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
Construction and deconstruction activities at the dam sites could cause a temporary increase in nighttime noise levels at Iron Gate Dam.	1	NCFEC	None	NCFEC
	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
	4	LTS (short term)	None	LTS (short term)
Reservoir restoration activities could result in short-term increases in noise levels in the project vicinity.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
Blasting activities at Copco 1 Dam could increase vibration levels.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities at the dam sites could require the transport of waste to off-site landfills and construction worker commutes which would cause increases in noise along haul routes.	2, 3, 4, 5	LTS (short term)	None	LTS (short term)
Construction activities at the dam sites could increase short-term vibration levels.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
	4	LTS (short term)	None	LTS (short term)
<i>Keno Transfer</i>				
The transfer of Keno dam to the DOI could have adverse effects on noise and vibration.	2, 3	NCFEC	None	NCFEC
<i>East and Westside Facilities – Programmatic Measure</i>				
The decommissioning of the East and Westside Facilities could have adverse effects on Noise and Vibration.	2, 3	LTS (short term)	None	LTS (short term)
<i>KBRA – Programmatic Measures</i>				
Construction activities associated with the KBRA could cause temporary increases in noise and vibration levels.	2,3	S (short term)	NV-1: Noise and Vibration Control Plan	LTS (short term)
Operational activities associated with the Fisheries Reintroduction Management Plan could result in temporary increases in noise and vibration levels from vehicles associated with trap-and-haul activities.	2, 3	S (short term)	NV-1: Noise and Vibration Control Plan	LTS (short term)

Table 5-1. Summary of Environmental Impacts Relative to NEPA and CEQA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<i>Trap and Haul – Programmatic Measure</i>				
Trap and Haul operations could result in temporary increases in noise and vibration levels from vehicles used to relocate fish.	4, 5	S (short term)	NV-1: Noise and Vibration Control Plan	LTS (short term)

¹ Short term is defined as <2 years.

² Long term is defined as 2-50 years.

³ Minimal short-term settling, sedimentation, or scouring is expected to occur in the Klamath River or the estuary as a result of dam removal (see Section 3.11.4.3), and estimates of baseline sediment delivery for the Klamath Basin indicate that long-term sediment delivery rates will not change substantially under dam removal (Stillwater Sciences 2010); therefore, there would be no indirect effect on water temperatures in the Klamath Estuary under Alternatives 2, 3, and 5.

⁴ Because these species were introduced and they occur in other nearby water bodies, their loss would not be considered significant from a biological perspective, and would benefit native species.

⁵ Periphyton are algae that grow attached to rocks and other substrates on a riverbed. Although sometime these species cause nuisance conditions, they are rarely considered toxic. Increased non-toxic periphyton biomass would not lead to increases in algal toxins in the Klamath River. Blooms of phytoplankton (suspended algae) occurring in the calm, lake-like waters are responsible for the production of algal toxins, such as microcystin, in the Klamath River downstream from Iron Gate Dam. Noxious phytoplankton would not thrive in the free flowing river following dam removal.

⁶ An editorial clarification was made to this determination for Alternative 5 in Section 3.4 Algae. As indicated by the analysis under the Proposed Action in Section 3.4, Algae, the determination for Alternative 5 in the Hydroelectric Reach from Copco 1 Reservoir to Iron Gate Reservoir should also have been a significant effect.

⁷ A nutrient reduction program in the Keno Impoundment/Lake Ewauna and Upper Klamath Lake would be designed to improve water quality (increasing seasonally low dissolved oxygen and reducing seasonal algal blooms) and fish passage through the Keno Impoundment/Lake Ewauna in summer and fall months, however implementation of this nutrient reduction program will require future environmental compliance investigations and a determination on significance cannot be made at this time.

⁸ Vehicle exhaust emissions associated with continued maintenance and operation of the Four Facilities are expected to be minimal and were not quantified for this analysis.

⁹ While Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce impacts to LTS, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.

¹⁰ Studies will be conducted to identify cultural resources and reduce significant impacts to these resources. Implementation of specific plans and projects associated with the KBRA will require future environmental compliance as appropriate.

¹¹ While construction activities that would occur for the ongoing restoration programs are anticipated to result in potentially significant impacts to traffic and transportation, it is assumed that the use of best management practices incorporated into the project would minimize any traffic impacts to less than significant.

KEY:

Significance:

NCFEC = No Change From Existing Conditions

B = Beneficial

LTS = Less than Significant

S = Significant

N/A = Not Applicable

Alternatives:

1 = No Action/No Project

2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)

3 = Partial Facilities Removal of Four Dams Alternative

4 = Fish Passage at Four Dams Alternative

5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
3.12 Tribal Trust			
<i>The Klamath Tribes</i>			
Continued operation of the four Klamath River dams would result in no change from existing conditions to the trust resources of The Klamath Tribes and other resources traditionally used by The Klamath Tribes.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality and aquatic resources issues related to The Klamath Tribes' trust resources and other resources traditionally used by the Tribes (see Sections 3.2, 3.3, and 3.5).	2, 3	B (long term)	None
	5 (at Copco and Iron Gate Reservoirs only)	B (long term)	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by The Klamath Tribes; however the remaining critical issues affecting their trust resources and other resources traditionally used by the Klamath Tribes would persist.	4	B (long term)	None
<i>KBRA – Programmatic Measures</i>			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B (long term)	None
Establishment of The Klamath Tribes Interim Fishing Site could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B (long term)	None
Implementation of the Mazama Forest Project could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B (long term)	None
<i>Quartz Valley Community</i>			
Continued impoundment of water could affect traditionally used resources.	1, 4	NCFEC	None
Removal of the Four Facilities could affect traditionally used resources.	2, 3	B (long term)	None
	5 (at Copco and Iron Gate Reservoirs only)	B (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
<u>KBRA – Programmatic Measures</u>			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B (long term)	None
<i>Karuk</i>			
Continued operation of the four Klamath River dams would result in no change from existing conditions to traditionally use resources of the Karuk.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality and aquatic resources issues related to traditionally used resources of the Karuk (see Sections 3.2, 3.3, and 3.5).	2, 3	B (long term)	None
	5 (at Copco and Iron Gate Reservoirs only)	B (long term)	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Karuk, however the remaining critical issues affecting their traditionally used resources.	4	B (long term)	None
<u>KBRA – Programmatic Measures</u>			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to traditionally used resources.	2, 3	B (long term)	None
<i>Hoopa Valley Indian Tribe</i>			
Continued impoundment of water at the Four Facilities could affect tribal trust resources of the Hoopa Valley Indian Tribe and other resources traditionally used by the Hoopa Valley Indian Tribe.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality and aquatic resources issues related to the Hoopa Valley Indian Tribe trust resources and other traditionally used resources (see Sections 3.2, 3.3, and 3.5).	2, 3	B (long term)	None
	5 (at Copco and Iron Gate Reservoirs only)	B (long term)	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Hoopa Valley Indian Tribe; however the remaining critical issues affecting their trust resources and other traditionally resources would persist.	4	B (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
<u>KBRA – Programmatic Measures</u>			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B (long term)	None
<u>Yurok Tribe</u>			
Continued impoundment of water at the Four Facilities would result in no change from existing conditions to the trust resources of the Yurok Tribe and other traditionally used resources.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality, terrestrial, and aquatic resources issues related to the Yurok Tribe trust resources and other traditionally used resources (see Sections 3.2, 3.3, and 3.5).	2, 3	B (long term)	None
	5 (at Copco and Iron Gate Reservoirs only)	B (long term)	B
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Yurok Tribe; however the remaining critical issues affecting their trust resources and other resources traditionally used by the Yurok would persist (see Sections 3.2 and 3.3).	4	B (long term)	None
<u>KBRA – Programmatic Measures</u>			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B (long term)	None
<u>Resighini Rancheria</u>			
Continued impoundment of water at the Four Facilities would result in no change from existing conditions to Resighini Rancheria traditionally used resources.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality, terrestrial, and aquatic resources issues related to the Resighini Rancheria traditionally used resources (see Sections 3.2, 3.3, and 3.5).	2, 3	B (long term)	None
	5 (at Copco and Iron Gate Reservoirs only)	B (long term)	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Resighini Rancheria; however the remaining critical issues affecting their traditionally used resources would persist (see Sections 3.2 and 3.3).	4	B (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
3.15 Socioeconomics			
<i>Four Facilities</i>			
Changes in annual O&M expenditures required to continue the operation of the existing facilities could affect employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
	2, 3, 5	Adverse (long term)	None
Construction activities associated with dam removal and fish passage facilities would increase economic output, employment, and labor income during the construction period in Klamath and Siskiyou Counties.	2, 3, 4, 5	B (short term)	None
Mitigation spending after the deconstruction period could increase economic output, employment, and labor income in the regional economy.	2, 3, 4, 5	B (short term)	None
<i>Commercial Fishing</i>			
Changes in commercial fishing harvests could change fishing revenues and affect employment, labor income, and output in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	B (long term)	None
<i>Recreation</i>			
Changes to reservoir recreation expenditures could affect jobs, labor income, employment, and output in the regional economy.	1, 5 (due to continued use of J.C. Boyle Reservoir)	NCFEC	None
	2, 3, 5 (due to removal of Copco and Iron Gate Reservoirs)	Adverse (long term)	None
Changes to in-river sport fishing opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	B (long term)	None
Changes to ocean sport fishing could affect recreational expenditures in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	B (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Changes to whitewater boating opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	Adverse (from reduced whitewater boating expenditures in the Upper Klamath River and Hell's Corner Reach)	None
<i>Indian Tribes</i>			
The continuation of dam operations could contribute to continuation and possible decline in the existing economic conditions of Indian Tribes in the area of analysis.	1	NCFEC	None
Dam removal and the construction of fish passage could increase fish harvest for subsistence, cultural practices and commercial uses and provide economically beneficial opportunities for Indian Tribes residing on the Klamath River (excluding the Hoopa Valley Tribe, who reside on the Trinity River).	2, 3, 4, 5	B (long term)	None
<i>PacifiCorp Hydroelectric Service</i>			
Energy rates for PacifiCorp customers could change.	1, 4, 5	UKN	None
Removal of the Four Facilities could result in increased energy rates for PacifiCorp customers.	2, 3	NCFEC	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
<i>Property Values and Local Government Revenues</i>			
Property values surrounding Iron Gate and Copco Reservoirs could change.	1, 4, 5 (around Copco 2 Reservoir)	NCFEC	None
	2, 3, 5 (around Copco 1 and Iron Gate Reservoirs)	Adverse (short term and long term)	None
Changes in real estate values around Copco 1 and Iron Gate Reservoirs could affect property tax revenues to Siskiyou County.	2, 3, 5	Adverse (short term); UKN ¹ (long term)	None
	4	NCFEC	None
Removal of the Four Facilities could affect property tax revenues to Siskiyou and Klamath Counties from PacifiCorp.	2, 3, 5	NCFEC	None
Construction worker spending could increase sales and use tax receipts in Siskiyou and Klamath Counties.	2, 3	B (short term)	None
Changes in visitation for recreation activities could affect sales tax revenues.	2, 3	UKN ²	None
<i>PacifiCorp's Property Taxes</i>			
PacifiCorp's property tax payments to Siskiyou and Klamath Counties could change.	1, 4	NCFEC	None
<i>Ongoing Restoration Activities</i>			
Ongoing restoration activities could generate employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
<i>Irrigated Agriculture</i>			
Changes in Reclamation's Klamath Project hydrology could affect farm revenues, employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
Changes in on-farm pumping costs could affect farm revenues, employment, labor income, and output in the regional economy.	1, 4	NCFEC	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Water acquisitions could affect farm revenues, employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
<i>Refuge Recreation</i>			
Changes in water supply could affect visitor spending for refuge recreation and affect employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
<i>Tribal Program</i>			
Ongoing fisheries and conservation management by The Klamath Tribes, Karuk Tribe, and Yurok Tribe could generate employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
<i>East and Westside Facilities – Programmatic Measure</i>			
Decommissioning of the East and Westside facilities could result in economic effects.	2, 3	NCFEC	None
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measure</i>			
Construction activities associated with the Yreka Water Supply Pipeline could increase economic output, employment, and labor income during the construction period in Siskiyou County.	2, 3	B (short term)	None
<i>KBRA – Programmatic Measures</i>			
Fish habitat restoration for the Fisheries Program could affect employment, labor income, and output in the regional economy.	2, 3	B (during project implementation)	None
In the long term, the Fisheries Program could support increased fish abundance in the Klamath River and tributaries.	2, 3	B (long term)	None
Construction, analysis, and monitoring activities under the Water Resources Program could affect employment, labor income, and output in the regional economy.	2, 3	B (during project implementation)	None
Changes in Reclamation's Klamath Project hydrology could affect gross farm revenue and the regional economy.	2, 3	B (long term)	None
Increases in on-farm pumping costs could affect household income and reduce employment, labor income, and output in the regional economy.	2, 3	Adverse (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Water acquisitions via permanent, voluntary water rights sales could affect farm revenues and employment, labor income, and output in the regional economy.	2, 3	B (long term)	None
Water acquisitions via short-term water leasing could decrease farm revenues and reduce employment, labor income, and output in the regional economy.	2, 3	Adverse (short term)	None
Changes in water supply could affect refuge recreation expenditures and employment, labor income, and output in the regional economy.	2, 3	B (long term)	None
Implementation of regulatory assurances under the KBRA could support employment, labor income, and output in the regional economy.	2, 3	B (short term) NCFEC (long term)	None
Implementation of the Klamath County Economic Development Plan could support long-term economic growth in Klamath County.	2, 3	B (long term)	None
If passed by voters, funds from the California Water Bond Legislation could be used by Siskiyou County to improve economic conditions in the county and to support future economic growth.	2, 3	B (long term)	None
Construction and monitoring activities associated with Tribal Program actions would increase jobs, labor income, and output for The Klamath Tribes, Karuk Tribe, and Yurok Tribe.	2, 3	B (short term)	None
3.16 Environmental Justice			
Continued impoundment of water at the reservoirs and declines in fisheries could disproportionately affect tribal people.	1	NCFEC	None
Dam removal and construction of fish passage facilities could affect fisheries and disproportionately affect tribal people.	2, 3, 4, 5	B (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Increased traffic, air quality emissions, and noise associated with construction activities could disproportionately affect county residents and tribal people.	1	NCFEC	None
	2, 3, 4, 5	Disproportionate Effects (short term)	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks AQ-4: Dust control measures during blasting operations NV-1: Noise and Vibration Control Plan

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Release of sediment from reservoirs could cause disproportionate short-term impacts on county residents and tribal people.	1	NCFEC	None
	2, 3, 5	NCFEC (short term, inorganic and organic contaminants); Disproportionate Effect (short term, reduced mussel populations)	None
Changes to water quality could cause disproportionate long-term water quality impacts on county residents and tribal people.	1, 4, 5	NCFEC	None
	2, 3	B (long term)	None
Changes in county revenues could decrease county funding of social programs used by county residents.	1, 4	NCFEC	None
	2, 3, 5	Disproportionate Effects (long term)	None
Continued impoundment of water in the reservoirs and the installation of fish passage facilities could result in changes to water quality and fish populations which could disproportionately impact tribal health and social wellbeing in the long term.	1, 4, 5	NCFEC	None
	2, 3	B (long term)	None
Traffic on associated haul roads could disproportionately affect county residents and tribal people.	2, 3, 4, 5	Disproportionate Effects (short term); NCFEC (long term)	TR-1: Relocate Jenny Creek Bridge and Culverts
Dam removal activities and construction of fish passage could provide jobs for county residents and tribal people that are low income and minority.	2, 3, 4, 5	B (short term)	None
Removal of existing recreation facilities from the banks of the existing reservoirs could disproportionately affect county residents or tribal people.	2, 3	NCFEC	None
Keno Transfer			
The Keno Transfer could have adverse effects on environmental justice issues.	2, 3	NCFEC	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
East and Westside Facilities – Programmatic Measure			
The East and Westside Facilities decommissioning could have adverse effects on environmental justice issues.	2, 3	NCFEC	None
City of Yreka Water Supply Pipeline Relocation – Programmatic Measure			
The installation of the Yreka Water Supply Pipeline could disproportionately affect county residents or tribal people.	2, 3	NCFEC	None
KBRA – Programmatic Measures			
Implementation of the Phases I and II Fisheries Restoration Plans, the Fisheries Monitoring Plan, the Fisheries Reintroduction and Management Plan, and the Klamath River Tribes Interim Fishing Site could disproportionately affect tribal populations.	2, 3	B (long term)	None
Implementation of the Water Use Retirement Program, Off-Project Reliance Program, and Interim Flow and Lake Level Program could disproportionately affect low income and minority farm workers.	2, 3	Disproportionate Effects (short term); NCFEC (long term)	None
Implementation of the Tribal Fisheries and Conservation Management Program could disproportionately affect the tribes.	2, 3	B (long term)	None
Implementation of the Tribal Programs Economic Revitalization could disproportionately affect the tribes.	2, 3	B (long term)	None
Implementation of the Mazama Forest Project could disproportionately affect the tribes.	2, 3	B (long term)	None
Implementation of the Klamath County Economic Development Plan could disproportionately affect low income and minority people in Klamath County.	2, 3	B (long term)	None

Table 5-2. Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Implementation of the California Water Bond Legislation could disproportionately affect low income and minority people in Siskiyou County.	2, 3	B (long term)	None

¹ Available data are insufficient to quantify such effects or to determine whether gains in riverine real estate values would be sufficient to offset the losses in reservoir values.

² Changes in recreation expenditures and associated sales taxes vary by recreation activity. The net effect of changes in recreation expenditures is unknown.

KEY:

Significance:

NCFEC = No Change From Existing Conditions

B = Beneficial

LTS = Less than Significant

S = Significant

N/A = Not Applicable

Alternatives:

1 = No Action/No Project

2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)

3 = Partial Facilities Removal of Four Dams Alternative

4 = Fish Passage at Four Dams Alternative

5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

5.5 Significant and Unavoidable Impacts

Significant and unavoidable adverse effects refer to the environmental consequences of an action that cannot be avoided by redesigning the project, changing the nature of the project, or implementing mitigation measures. NEPA requires a discussion of any adverse impacts that cannot be avoided (40 CFR Section 1502.16). The CEQA Guidelines require a discussion on significant environmental effects that cannot be avoided as well as those that can be mitigated but not reduced to an insignificant level (Section 15126.2 (b) and Section 15126.2(a)). This section discusses the significant and unavoidable impacts of the Klamath River dam removal alternatives presented in Chapter 2, Project Description. For a summary of significant environmental effects that cannot be avoided relative to CEQA and NEPA see Table 5-3 (also Executive Summary, Table ES-4).

5.5.1 Water Quality

Short-term significant and unavoidable impacts would result from sediment release (and corresponding increases in suspended sediment concentrations [SSC]) associated with dam removal under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative. These short term (<2 years following dam removal) increases in SSCs would result in a significant impact in the Hydroelectric Reach downstream from J.C. Boyle Dam. In the Lower Klamath Basin, sediment release from dam removal under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in non-attainment of applicable North Coast Basin Plan water quality objectives for suspended material in the lower Klamath River and the Klamath Estuary and would substantially adversely affect the cold freshwater habitat (COLDFRESH) beneficial use. Thus, these short-term increases in SSCs would be significant and unavoidable in the lower Klamath River and the Klamath Estuary.

Dissolved oxygen impacts are anticipated to be secondary impacts of the sediment release during reservoir drawdown. Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, elevated SSCs during reservoir drawdown and dam removal would result in increases in oxygen demand and reductions in dissolved oxygen in the Hydroelectric Reach downstream from J.C. Boyle Reservoir and in the lower Klamath River from Iron Gate Dam to Clear Creek. These decreases in dissolved oxygen would be significant and unavoidable impacts.

5.5.2 Aquatic Resources

Under the Proposed Action, Partial Facilities Removal Alternative, and Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, elevated levels of SSC during the 2 to 3 month reservoir drawdown period would result in short-term

significant and unavoidable impacts on critical habitat for coho salmon as well as essential fish habitat for Chinook and coho salmon.

Suspended sediment concentrations and bedload sediment transport and deposition under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in the short-term substantial reduction in the abundance of a year class of coho salmon (Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units), summer and winter steelhead, Pacific Lamprey, green sturgeon, freshwater mussels, and benthic macroinvertebrate individuals present in the mainstem after reservoir drawdown in January 2020. Based on the reduction in the abundance of a year class in the short-term, the loss of these individuals during short-term increases in SSC and bedload movement would be significant and unavoidable.

5.5.3 Algae

The Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative¹ dam removal, conversion of the reservoir areas to a free-flowing river, and the elimination or reduction of hydropower peaking operations could cause long-term increases in nuisance periphyton growth due to increases in available habitat along low-gradient channel margin areas downstream from J.C. Boyle Dam; this impact would be significant and unavoidable.

While nutrient increases in this reach would be less than significant following full attainment of the Oregon and California TMDLs (Section 3.2.4.3.2.3), removal of the reservoirs and elimination of hydropower peaking operations in the J.C. Boyle Peaking Reach would immediately provide additional low-gradient habitat suitable for periphyton. The particular periphyton species that may become abundant in these areas are unknown (E. Asarian, pers. comm., 2011). The overall effect of the Proposed Action would likely be to increase periphyton in the re-exposed margins of low gradient river channels in the Hydroelectric Reach until full attainment of the Oregon and California TMDLs can be achieved.

5.5.4 Air Quality

Under the Proposed Action and Partial Facilities Removal Alternatives, total emissions of Particulate Matter <10 microns (PM₁₀) from construction equipment exhaust, on-road haul trucks, commuting vehicles, and fugitive dust emissions from unpaved roads and general earth moving activities would exceed Siskiyou County's thresholds of significance. This impact could not be mitigated to less than significant with implementation of the mitigation measures in Section 3.9, Air Quality, and would remain a significant and unavoidable impact.

¹ This revision reflects an editorial clarification. As indicated by the analysis under the Proposed Action, the determination for Alternative 5 in the Hydroelectric Reach from Copco 1 Reservoir to Iron Gate Reservoir should also have been a significant effect.

Construction activities associated with the KBRA programs under the Proposed Action and Partial Facilities Removal Alternative could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust. These short-term impacts would be significant and unavoidable. Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce the severity of these effects to a less than significant level; however, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Additionally, operational activities associated with the Fisheries Reintroduction and Management Plan could result in short-term increases in air quality pollutant emissions from vehicle exhaust associated with trap-and-haul activities. While implementation of mitigation measures in Section 3.9, Air Quality would reduce the severity of these impacts to less than significant, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level.

5.5.5 Greenhouse Gases/Global Climate Change

Implementation of the Proposed Action and decommissioning and removal of Iron Gate, Copco 1, and Copco 2 dams (which are California Renewable Portfolio Standard [RPS]-eligible facilities) is contrary to implementation of AB 32 but the significance would diminish as new renewable sources are developed. Although it is expected that PacifiCorp would add new sources of renewable power that would replace the removed dams, the analysis in Section 3.10, Greenhouse Gases/Global Climate Change, provides a conservative assumption that emissions could still occur when the dams are removed.

Section 3.10, Greenhouse Gases/Global Climate Change, describes that the California Air Resources Board expects that implementation of its Scoping Plan (2008) would reduce 21.3 million metric tons carbon dioxide equivalent by 2020 (from 2005 baseline) from California's RPS; therefore, the possible increase in emissions from removing the dams would account for three percent of the expected emissions reduction. Under a business-as-usual scenario, which assumes that the Scoping Plan would not be implemented, this would impede California's ability to meet its emission reduction goal. While mitigation measures in Section 3.10, Greenhouse Gases/Global Climate Change, would be implemented to reduce emissions from power replacement, it is expected that greenhouse gas emissions would remain significant and unavoidable in the short term until PacifiCorp adds new sources of renewable power that would replace the removed dams. Implementation of the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would also result in the reduced operation or decommissioning of the power generating facilities of the dams; thus, electricity generation capacity would require replacement with other sources of power.

5.5.6 Cultural and Historic Resources

Under the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative some, if not all, of the Four Facilities and their

associated hydroelectric facilities would be removed or altered. These facilities are part of the Klamath Hydroelectric Historic District (KHHD), which is eligible for the National Register of Historic Places. Removal of these structures constitutes a significant and unavoidable impact.

Implementation of the following KBRA programs would include ground disturbing activities that are likely to have a significant impact on cultural and historic resources that are eligible for inclusion on the National Register and/or California Register. These KBRA programs include:

- Phases 1 and 2 Fisheries Restoration Plans
- Fisheries Reintroduction and Management Plan
- Wood River Wetland Restoration Project
- On-Project Plan
- Water Use Retirement Program
- Fish Entrainment Reduction
- Klamath Tribes Interim Fishing Site
- Mazama Forest Project

Studies will be conducted to identify cultural resources and measures to reduce significant impacts to those resources. As described in Section 3.13, Cultural and Historic Resources, implementation of specific plans and projects associated with Phase 1 and 2 Fisheries Restoration will require future environmental compliance as appropriate. While Mitigation Measures CHR-1, CHR-2, CHR-3, and CHR-4 would be implemented, these impacts would remain significant and unavoidable.

5.5.7 Scenic Quality

Ongoing fish habitat restoration actions would occur under the No Action/No Project Alternative throughout the entire basin with the exception of the Trinity River Basin. Activities related to these actions including floodplain rehabilitation, large woody debris replacement, fish passage correction, and cattle exclusion fencing, among others would include construction activities which could result in short-term significant impacts on scenic resources. These impacts would be significant and unavoidable in the short term.

Implementation of the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in the removal of some historic properties. While the removal of buildings in and return to a natural landscape is preferable under the Bureau of Land Management's (BLM) Visual Resource Management (VRM) process, some historic scenery elements may be considered socially valued and their elimination from the scenic character would be considered a significant and unavoidable scenery impact of the project.

In addition to the removal of historic properties, removal of dams and reservoirs would result in substantial changes in the former reservoir areas during drawdown and until restoration is complete. Receding water in the current reservoirs would expose reservoir sediment. It is expected that the river channel would appear very similar to conditions

before the river was impounded (with exception of vegetation not yet being established). The alternatives would involve stabilizing and revegetating the newly exposed reservoir areas with herbaceous and woody vegetation. Until the restoration was complete, however, the area would appear barren and/or sparsely vegetated. Additionally, Section 3.19, Scenic Quality, describes that studies estimate that it will take 30 years for the river corridor habitats to fully recover from the dam removals (Phillip Williams and Associates [PWA] 2009). Thus, these impacts on scenic resources would be significant and unavoidable in both the short term and long term.

Sediment release during reservoir drawdown would also result in temporary significant and unavoidable impacts to water aesthetics (clarity, turbidity (depth of view), and color). The impact on the appearance of the Klamath River would be temporary; however, as no mitigation measures could be implemented to reduce the impact on scenic resources, it would be significant and unavoidable. Deconstruction, restoration, and construction activities associated with the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in areas around the dams and in the vicinity of construction being inconsistent with the surrounding natural landscape and the VRM classification. Specifically, scenic quality changes during deconstruction, restoration, and construction activities (including the potential replacement of the existing wooden Lakeview Bridge just downstream from Iron Gate Dam with a concrete bridge and the relocation of existing recreation facilities under the Proposed Action and the Partial Facilities Removal Alternative) would be caused by the temporary presence of large construction vehicles and equipment, temporary structures, temporary access roads, equipment storage areas, material stockpiles, piles of demolition materials, and other common construction items that would detract from the natural surroundings. These temporary impacts on scenic resources would be significant and unavoidable.

The addition of the fishways, under the Fish Passage at Four Dams Alternative and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, would change the scenic character in the vicinity of the dams by adding hardscape elements that would blend with the facility features but would not blend with the natural landscape and could dominate views due to their size. At Copco 1 and Iron Gate Dams, the fishway structures would be particularly large (see Table 3.19-3 in Section 3.19, Scenic Quality). Although the fishways have not yet been designed, they likely could display angular geometry, continuous straight lines, and flat surfaces that may moderately contrast with the colors, forms, and textures of the surrounding characteristic landscape, or may be insignificant compared to scenery impacts of the existing dam facilities. Thus, the addition of fishways could be a significant, permanent impact. No mitigation measures could be implemented to lessen the impact on scenic quality.

Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, construction of a new, elevated City of Yreka Water Supply Pipeline and steel pipeline

bridge to support the pipe above the river could result in short-term and long-term impacts significant and unavoidable impacts on scenic resources.

Construction activities associated with fish collection facilities as part of the Fisheries Reintroduction and Management Plan of the KBRA would introduce new features into the landscape. Facilities required for trap and haul operations would result in impacts on scenic resources at Keno and Link River Dams. This would result in a long-term significant and unavoidable impact on scenic quality.

5.5.8 Recreation

Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, the Hell's Corner Reach of the Klamath River, which currently provides whitewater boating opportunities, would lose acceptable and predictable flows necessary for whitewater boating. Decreases in the number of days with acceptable flows for whitewater boating would be a significant and unavoidable impact in the Hell's Corner Reach. Loss of the predictable peaking flows in the J.C. Boyle Peaking Reach under the Fish Passage at Four Dams Alternative and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would inhibit the ability of commercial outfitters to provide whitewater boating opportunities on a regular scheduled basis. This water flow impact on whitewater boating opportunities would be a significant and unavoidable impact.

5.5.9 Noise and Vibration

Construction activities at the Copco 1 Development associated with the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would produce noise and vibration levels resulting in significant and unavoidable impacts that could affect sensitive receptors in the area. Noise impacts would be significant and unavoidable for outdoor receptors during construction.

Construction activities at Iron Gate Dam would cause temporary increases in nighttime noise levels for the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative resulting in a significant and unavoidable impact. Reservoir restoration activities in the vicinity of the dams and reservoirs would also result in short-term increases in noise levels. Impacts related to vibration produced during construction activities under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would be significant and unavoidable. These short-term noise and vibration impacts would remain significant and unavoidable even after implementation of the mitigation measure in Section 3.23, Noise and Vibration.

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.2 Water Quality				
<i>Suspended Sediments</i>				
Upper Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the Hydroelectric Reach downstream from J.C. Boyle Dam.	2, 3, 5	S (short term)	None	S (short term)
Lower Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the lower Klamath River and the Klamath Estuary.	2, 3, 5	S (short term)	None	S (short term)
<i>Dissolved Oxygen</i>				
Upper Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the Hydroelectric Reach downstream from J.C. Boyle Reservoir.	2, 3, 5	S (short term)	None	S (short term)
Lower Klamath Basin				
Dam removal and sediment release could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	S - (short term) lower Klamath River from Iron Gate Dam to Clear Creek	None	S – (short term) lower Klamath River from Iron Gate Dam to Clear Creek

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.3 Aquatic Resources				
<i>Critical Habitat</i>				
Reservoir drawdown associated with dam removal could alter the quality of critical habitat.	2, 3, 5	S (short term) coho	None	S (short term) coho
<i>Essential Fish Habitat</i>				
Reservoir drawdown associated with dam removal could alter the quality of EFH.	2, 3, 5	S (short term) Chinook and coho	None	S (short term) Chinook and coho
<i>Species Impacts</i>				
<u>Coho Salmon</u>				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect coho salmon.	2, 3, 5 (would only remove Copco 1 and Iron Gate)	S (short term) Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River	AR-1: Protection of mainstem spawning AR-2: Protection of outmigrating juveniles AR-3: Fall flow pulses AR-4: Hatchery management	S (short term) Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units
<u>Steelhead</u>				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect steelhead in the short term.	2, 3, 5	S (short term) summer and winter steelhead	AR-2: Protection of outmigrating juveniles AR-3: Fall flow pulses	S (short term) summer and winter steelhead
<u>Pacific Lamprey</u>				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect Pacific lamprey in the short term.	2, 3, 5	S (short term)	AR-2: Protection of outmigrating juveniles AR-5: Pacific lamprey capture and relocation	S (short term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
<u>Green Sturgeon</u>				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect green sturgeon.	2, 3, 5	S (short term)	AR-3: Fall flow pulses	S (short term)
<u>Freshwater mussels</u>				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect freshwater mussels in the short term.	2, 3, 5	S (short term)	AR-7: Freshwater mussel relocation	S (short term)
<u>Benthic Macroinvertebrates</u>				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect macroinvertebrates.	2, 3, 5	S (short term)	None	S (short term)
3.4 Algae				
<u>Hydroelectric Reach</u>				
Conversion of the reservoir areas to a free-flowing river, and the elimination of hydropower peaking operations could cause long-term increases in nutrient levels and biomass of nuisance periphyton in low-gradient channel margin areas within the Hydroelectric Reach downstream from J.C. Boyle Dam ¹	2, 3, 5 ²	S (long term)	None	S (long term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.9 Air Quality				
Vehicle exhaust and fugitive dust emissions from dam removal activities could increase emissions of VOC, NOx, CO, SO ₂ , PM ₁₀ , and PM _{2.5} to levels that could exceed Siskiyou County's thresholds of significance.	2, 3	S (short term)	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks	S (short term)
KBRA – Programmatic Measures				
Construction activities associated with the KBRA programs could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust.	2, 3	S (short term)	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks	S ³ (short term)
Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in air quality pollutant emissions from vehicle exhaust associated with trap-and-haul activities.	2, 3	S (short term)	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks	S (short term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.10 Greenhouse Gases/Global Climate Change				
Removing or reducing a renewable source of power by removing the dams or developing fish passage could result in increased GHG emissions from possible non-renewable alternate sources of power.	2, 3, 4, 5	S (long term)	CC-1: Market Mechanisms); CC-2: Energy Audit Program; and CC-3: Energy Conservation Plan	S (long term)
3.13 Cultural and Historic Resources				
Dam removal and construction of fish passage facilities could result in direct effects/impacts to J.C. Boyle Dam, Copco 1 Dam, Copco 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and on the KHHD, which is considered eligible for inclusion on the National Register and California Register.	2, 3, 4, 5	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	S (long term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA – Programmatic Measures				
Implementation of the KBRA programs including the Phase 1 and 2 Fisheries Restoration Plans, Fisheries Reintroduction and Management Plan, Wood River Wetland Restoration Project, On-Project Plan, Water Use Retirement Program, Fish Entrainment Reduction, Klamath Tribes Interim Fishing Site, and Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S (long term)	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4: Treatment of Indian Human Remains	S ⁴ (long term)
3.19 Scenic Quality				
Ongoing fish habitat restoration actions could result in short-term and long-term impacts on scenic resources.	1	S (short term)	None	S (short term)
The removal of historic properties could result in impacts on scenic resources.	2, 3, 5	S (long term)	None	S (long term)
Dam removal could result in short-term, and long-term impacts on scenic resources in formerly inundated reservoir areas.	2, 3, 5	S (short term and long term)	None	S (short term and long term)
Deconstruction and restoration activities could result in short-term impacts on scenic resources in the immediate vicinity of the Four Facilities.	2, 3, 5	S (short term)	None	S (short term)
Replacement of the existing wooden Lakeview Bridge just downstream from Iron Gate Dam with a concrete bridge could result in short-term and long-term impacts on scenic resources.	2, 3	S (short term)	None	S (short term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of existing recreation facilities, such as campgrounds and boat ramps, from the reservoir banks would result in short-term and long-term impacts on scenic resources.	2, 3	S (short term)	None	S (short term)
Sediment release during dam and reservoir removal could cause temporary changes in water quality and the appearance of the Klamath River in the area of the dams and downstream from Iron Gate Dam.	2, 3, 5	S (short term)	None	S (short term)
Demolition, construction, and restoration activities for the fishways could cause short-term adverse effects on the scenic vistas in the immediate vicinity of the Four Facilities.	4, 5	S (short term)	None	S (short term)
Fishways could cause substantial long-term impacts on scenic resources.	4, 5	S (long term)	SQ-2: Measures to Minimize Scenery Disturbances	S (long term)
<i>City of Yreka Water Supply Pipeline Relocation – Programmatic Measures</i>				
Construction of a new, elevated City of Yreka Water Supply Pipeline and steel pipeline bridge to support the pipe above the river could result in short-term and long-term impacts on scenic resources.	2, 3, 5	S (short term and long term)	SQ-2: Measures to Minimize Scenery Disturbances	S (short term and long term)
<i>KBRA – Programmatic Measures</i>				
Construction of fish management structures would introduce new features into the landscape.	2, 3	S (long term)	SQ-2: Measures to Minimize Scenery Disturbances	S (long term)
<i>Trap and Haul Operations – Programmatic Measure</i>				
Construction activities associated with fish collection facilities would introduce new features into the landscape.	4, 5	S (long term)	SQ-2: Measures to Minimize Scenery Disturbances	S (long term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.20 Recreation				
Changes in flows could decrease the number of days with acceptable flows for whitewater boating and recreational fishing in the Hells Corner Reach.	2, 3,	S (whitewater boating)	None	S (whitewater boating)
Loss of peaking flows in the J.C. Boyle Peaking Reach could affect whitewater boating opportunities in the Hell's Corner Reach.	4, 5	S (long term)	None	S (long term)
3.23 Noise and Vibration				
Construction and deconstruction activities at the dam sites could cause a temporary increase in noise levels at Copco 1 Dam that could affect residents in the area.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
Construction and deconstruction activities at the dam sites could cause a temporary increase in nighttime noise levels at Iron Gate Dam.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
Reservoir restoration activities could result in short-term increases in noise levels in the project vicinity.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)
Blasting activities at Copco 1 Dam could increase vibration levels.	2, 3, 5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)

Table 5-3. Summary of Significant Environmental Effects that Cannot be Avoided Relative to CEQA and NEPA

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities at the dam sites could increase short-term vibration levels.	2, 3,5	S (short term)	NV-1: Noise and Vibration Control Plan	S (short term)

¹ Periphyton are algae that grow attached to rocks and other substrates on a riverbed. Although sometime these species cause nuisance conditions, they are rarely considered toxic. Increased non-toxic periphyton biomass would not lead to increases in algal toxins in the Klamath River. Blooms of phytoplankton (suspended algae) occurring in the calm, lake-like waters are responsible for the production of algal toxins, such as microcystin, in the Klamath River downstream from Iron Gate Dam. Noxious phytoplankton would not thrive in the free flowing river following dam removal.

² An editorial clarification was made to this determination for Alternative 5 in Section 3.4, Algae. As indicated by the analysis under the Proposed Action in Section 3.4, Algae, the determination for Alternative 5 in the Hydroelectric Reach from Copco 1 Reservoir to Iron Gate Reservoir should also have been a significant effect.

³ While Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce impacts to LTS, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.

⁴ Studies will be conducted to identify cultural resources and reduce significant impacts to these resources. Implementation of specific plans and projects associated with the KBRA will require future environmental compliance as appropriate.

KEY:

Significance:

NCFEC = No Change From Existing Conditions

B = Beneficial

LTS = Less than Significant

S = Significant

N/A = Not Applicable

Alternatives:

1 = No Action/No Project

2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)

3 = Partial Facilities Removal of Four Dams Alternative

4 = Fish Passage at Four Dams Alternative

5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

5.6 Adverse Environmental Effects After Mitigation Relative to NEPA

Significant environmental effects that are adverse after mitigation are environmental effects of an action that cannot be avoided by redesigning the project, changing the nature of the project, or implementing mitigation measures. NEPA regulations require a discussion of any adverse impacts that cannot be avoided as a result of the Proposed Action (40 Code of Federal Regulations Part 1502.16). NEPA also requires a discussion of means to mitigate adverse impacts. These impacts are summarized in Table 5-3 for the purposes of NEPA and CEQA. Table 5-4 summarizes the adverse environmental impacts of the resources analyzed in this EIS/EIR specific to NEPA including Socioeconomics and Environmental Justice resources.²

5.6.1 Socioeconomics

Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, reduced annual operations and maintenance (O&M) expenditures required to continue the operation of the dams and existing facilities could affect employment, labor income, and output in the regional economy. These reductions in O&M expenditures would result in long-term adverse effects in the regional economy.

The Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in reduced reservoir recreation opportunities associated with dam and reservoir removal and could reduce recreational expenditures in the regional economy. If visitors prefer to recreate in a reservoir setting rather than the new river setting, they may choose to recreate outside of the region. Losses in recreation spending would directly affect several industries in the region and would result in secondary impacts on support industries. In addition, implementation of any of these three dam removal alternatives would result in loss of jobs and incomes for PacifiCorp workers employed in Siskiyou and Klamath Counties.

Another adverse effect would result from losses in whitewater boating opportunities under the Proposed Action and the Partial Facilities Removal Alternative. Specifically, flow decreases in the Hell's Corner Reach would result in losses of commercial trips and corresponding losses in recreation expenditures in the local economy.

Dam removal and the removal of Copco 1 and Iron Gate Reservoirs under the Proposed Action, Partial Facilities Removal Alternative, and Fish Passage at J.C. Boyle and

² Effects relative to tribal trust resources are not displayed in this table given that no new adverse effects were identified relative to the alternatives analyzed in this EIS/EIR. Section 3.12, Tribal Trust, of this EIS/EIR does, however, summarize the existing and ongoing tribal trust impacts present in the Klamath Basin.

Table 5-4. Summary of Adverse Environmental Effects Relative to NEPA¹

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
3.15 Socioeconomics			
<i>Four Facilities</i>			
Changes in annual O&M expenditures required to continue the operation of the existing facilities could affect employment, labor income, and output in the regional economy.	2, 3, 5	Adverse (long term)	None
<i>Recreation</i>			
Changes to reservoir recreation expenditures could affect employment, labor income, and output in the regional economy.	2, 3, 5	Adverse (long term)	None
Changes to whitewater boating opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy.	2, 3, 4, 5	Adverse (long term) from reduced whitewater boating expenditures in the Upper Klamath River and Hell's Corner Reach	None

Table 5-4. Summary of Adverse Environmental Effects Relative to NEPA¹

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Property Values and Local Government Revenues			
Property values surrounding Iron Gate and Copco Reservoirs could change.	2, 3, 5 (around Copco 1 and Iron Gate Reservoirs)	Adverse (short term and long term)	None
Changes in real estate values around Iron Gate and Copco Reservoirs and downstream could affect property tax revenues to Siskiyou County.	2, 3, 5	Adverse (short term); Unknown (long term) ²	None
Changes in visitation for recreation activities could affect sales tax revenues.	2, 3	Unknown ³	None
KBRA – Programmatic Measures			
Increases in on-farm pumping costs could affect household income and reduce employment, labor income, and output in the regional economy.	2, 3	Adverse(long term)	None
Water acquisitions via short-term water leasing could decrease farm revenues and reduce employment, labor income, and output in the regional economy.	2, 3	Adverse (short term)	None
3.16 Environmental Justice			
Increased traffic, air quality emissions, and noise associated with construction activities could disproportionately affect county residents and tribal people.	2, 3, 4, 5	Disproportionate Effects (short term)	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks AQ-4: Dust control measures during blasting operations NV-1: Noise and Vibration Control Plan

Table 5-4. Summary of Adverse Environmental Effects Relative to NEPA¹

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Release of sediment from reservoirs could cause disproportionate short term impacts on county residents and tribal people.	2, 3, 5	Disproportionate Effect (short term)	None
Changes in county revenues could decrease county funding of social programs used by county residents.	2, 3, 5	Disproportionate Effects	None
Traffic on associated haul roads could disproportionately affect county residents and tribal people.	2, 3, 4, 5	Disproportionate Effects (short term)	TR-1: Relocate Jenny Creek Bridge and Culverts
KBRA – Programmatic Measures			
Implementation of the Water Use Retirement Program, Off-Project Reliance Program, and Interim Flow and Lake Level Program could disproportionately affect low income and minority farm workers.	2, 3	Disproportionate Effects (short term)	None

¹ Effects relative to tribal trust resources are not displayed in this table given that no new adverse effects were identified relative to the alternatives analyzed in this EIS/EIR. Section 3.12, Tribal Trust of this EIS/EIR does however summarize the existing and ongoing tribal trust impacts present in the Klamath Basin.

² Available data are insufficient to quantify such effects or to determine whether gains in riverine real estate values would be sufficient to offset the losses in reservoir values.

³ Changes in recreation expenditures and associated sales taxes vary by recreation activity. The net effect of changes in recreation expenditures is unknown.

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5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

Copco 2, Remove Copco 1 and Iron Gate Alternative would affect private parcels with partial reservoir views, frontage/access or with river views subsequent to the action (Bender Rosenthal, Inc. 2011 and 2012). While a majority of the applicable private parcels are vacant residential land and single-family residential, changes caused by dam removal would have adverse effects on property values in the short term. However, the net magnitude of these changes is difficult to forecast. In the long term, land values of parcels downstream from Iron Gate Dam with river views could increase because of restoration of the river, including improved water quality and more robust anadromous fish runs. Along the same lines, if some land values are reduced and there are no offsetting increases in other property values, Siskiyou County property tax revenues might decline relative to the No Action/No Project Alternative, assuming nothing else changes that might impact property tax revenues, (e.g., tax rates). This would result in a short-term adverse impact.

Under the KBRA, increases in on-farm pumping costs would affect household income and reduce employment, labor income, and output in the regional economy. Under the Proposed Action and the Partial Facilities Removal Alternative, irrigators are pumping more ground water compared to the No Action/No Project Alternative and therefore are paying more for electricity under the Proposed Action and Partial Facilities Removal even with a decrease in electricity rates assumed in the Proposed Action (Reclamation 2012a and Reclamation 2012b). Thus, a reduced household income due to increased pumping costs would have a relatively small adverse impact on the regional economy.

Water acquisitions via short-term water leasing, which could occur as part of KBRA programs like the Off-Project Reliance Program and the Interim Flow and Lake Level Program, could decrease farm revenues and reduce employment, labor income, and output in the regional economy. These programs allow farmers to sell or lease their water for fisheries programs on a short-term basis when sufficient water is unavailable for fish. The regional economy would be affected by the loss in gross farm revenue generated on the land idled by farmers who voluntarily lease water. While some of these regional effects would be offset by household induced effects when farmers spend a portion of the compensation in the local area, short-term water leasing proposed in the KBRA is expected to have a short-term, adverse effect on the regional economy.

5.6.2 Environmental Justice

Implementation of the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in short-term construction-related impacts to air quality, traffic (including traffic on associated haul roads used during construction), and noise. These effects would result in short-term disproportionate effects to Siskiyou and Klamath County residents and tribal people. In addition, sediment release during reservoir drawdown under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove

Copco 1 and Iron Gate Alternative would result in reduced freshwater mussel populations which would disproportionately affect tribes that rely on the mussels as a food source. This would be a short-term disproportionate effect to tribal people.

Section 3.15, Socioeconomics, describes that the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would cause short-term and long-term declines in tax revenues to the counties in the area of analysis stemming from a discontinuation of tax revenue from PacifiCorp and a short-term decrease in property values near the reservoirs. Reductions in the counties' budgets and resulting reductions or eliminations in social programs would disproportionately affect low income and minority county residents and tribal people.

Under the KBRA, implementation of the WURP, Off-Project Reliance Program, and Interim Flow and Lake Level Program could result in voluntary land fallowing and permanent water right sales. In turn, farm labor jobs could be lost which could disproportionately affect low-income, minority farm workers, who could lose a portion of their income if farms no longer required their labor. These would be short-term disproportionate effects.

5.7 Synopsis of Major Impacts and Benefits of the Alternatives

This section presents a synopsis of major impacts and benefits for each alternative with a focus on aquatic resources and water quality. (All of the significant adverse impacts that cannot be avoided for all resource categories are listed in Table 5-3 and Table 5-4). This summary section presents impacts and benefits incrementally to illustrate potential key benefits and impacts that may occur under each alternative. Though impacts to all resources will ultimately be considered by the Secretary of the Interior when making the Determination on whether or not the Proposed Action is in the public interest, this summary focuses on restoring fisheries and improving water quality (fishery and water quality benefits are also summarized in Table 5-5 (also Executive Summary, Table ES-6)). A synthesis of this information is particularly important to address the question of whether and to what degree an alternative may advance the restoration of the salmonid fisheries of the Klamath Basin and to determine which alternative may be environmentally preferable. In addition, the Affected Environment/Existing Conditions is summarized because it is a valuable point of comparison. (For more detail on each alternative and how alternatives were selected refer to ES.5 Alternatives Development and Chapter 2 Proposed Action and Description of Alternatives).

The structure of the section is as follows:

- Affected Environment/Existing Conditions;
- Alternative 1 (No Action/No Project Alternative);
- Alternative 4 (Fish Passage at Four Dams Alternative);

- Alternative 5 (Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate);
- Alternatives 2 (Full Facilities Removal of Four Dams (Proposed Action)) and 3 (Partial Removal of Four Dams);
- Comparison of Alternative 2 and 3

Under NEPA (40 CFR Part 1502.16, Environmental Consequences), a discussion of the environmental impacts of the alternatives, including the Proposed Action, should be included. A discussion of the potential beneficial effects of the alternatives is also valuable for decisionmakers when comparing and contrasting alternatives and determining the best course of action.

CEQA Guidelines require the balancing, as applicable, of the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve a project (Section 15093 (a)-(c)). If the specific benefits, including region-wide or Statewide environmental benefits of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered “acceptable.” When a Lead Agency approves a project which will result in the occurrence of significant effects which are identified, but not avoided or substantially lessened, the Lead Agency under CEQA shall state in writing the specific reasons to support its action based on the Final EIS/EIR or other information in the record. This statement becomes the statement of overriding considerations as required under CEQA.

As illustrated throughout this Executive Summary, many measures agreed upon in the KHSA and KBRA centered on improving and resolving issues of low or declining fish populations and fisheries, inadequate water supplies, and degraded water quality. The primary goal of these agreements is to improve the condition and reliability of these basin resources and thereby benefit the communities who rely on them, or historically depended on them, for a way of life. This includes tribal, fishing, farming, and recreational communities throughout the Klamath Basin.

One example of the inter-relatedness of basin resources and communities can be illustrated by evaluating the impacts and benefits of the alternatives on tribal communities where environmental justice is a concern. Reversing the consequences of barriers to fish passage, degraded fish habitat, and degraded water quality throughout the basin could result in great benefit to tribal communities relying on fish, shellfish, riparian plants, clean water, and other resources for their subsistence, ceremonies, physical health, way of life, and spiritual well-being. While sediment release and other construction related activities during dam removal could cause short term (1 to 2 years) adverse impacts on fisheries downstream from the Hydroelectric Reach, salmon and other aquatic resources would be expected to return to population levels observed prior to dam removal (in 2010 when the Notice of Preparation was issued) within 5 years, and would provide long-term benefits to Indian Tribes for 50 years and beyond (these effects for Indian Tribes are analyzed in Section 3.16).

Because restoring fisheries, improving water quality, and helping communities are major goals of the Proposed Action and of the action alternatives, the major long-term benefits and impacts of each alternative are summarized below relative to these goals.

5.7.1 Existing Conditions/Affected Environment

The Klamath Basin currently suffers from degraded fisheries, excessive exposure of salmon to disease, degraded habitat quality (including altered flows, water temperatures, river channel structure, and invasive species), blocked access to historical habitat, and degraded water quality (including problems with dissolved oxygen, pH, nutrient enrichment, algal growth, and algal toxins). Major water quality problems exist in Upper Klamath Lake, Keno Impoundment/Lake Ewauna, and the reservoirs in the Hydroelectric Reach, as well as the Lower Klamath Basin downstream from Iron Gate Dam.

Results of these impaired water quality and habitat conditions include fish die-offs, listings under ESA and the California Endangered Species Act (CESA), health advisory postings for algal toxins in Copco 1 and Iron Gate reservoirs since 2005, and commercial fishing closures. Circumstances for salmonid fisheries and threatened and endangered species in the Klamath Basin are not improving. In addition, basin water supplies are over-allocated and do not meet all user needs; these challenges have been particularly acute in dry years. Water shortages, combined with the need to provide water to address the needs of ESA-listed species (suckers in Upper Klamath Lake and coho salmon in the Klamath River), national wildlife refuges, and farming communities have led to the reduction of irrigation water deliveries to farmers in dry years. In short, existing conditions represent a continued hardship for fishing, farming, tribal, and recreational communities. In particular, the Klamath Tribes have had to bear the hardship of being without salmon in the Upper Basin for nearly 100 years and without harvestable sucker populations for 25 years; these species are fundamental to their diet, their ceremonies, and their cultural well-being.

5.7.2 Alternative 1 (No Action/No Project Alternative)

Alternative 1 (No Action/No Project Alternative) is continued operation of the Klamath Hydroelectric Project under an annual license issued by FERC and would result in the continuation of many of the conditions described under Existing Condition/Affected Environment. This alternative would continue to block anadromous fish access to over 420 miles of historical habitat, including low gradient habitat of critical importance to spawning and rearing under Copco 1 and Iron Gate reservoirs. Also, access to cold water springs (areas of ground water discharge), particularly in the Upper Basin, would continue to be blocked. These cold water springs offer some protection to aquatic species against the future changes associated with climate change and improve winter growth opportunities for rearing fish. Disease issues related to crowding of fish below Iron Gate Dam, atypically stable flows, disrupted sediment transport processes, and over abundance of an intermediate hosts for fish disease would persist. Iron Gate hatchery juvenile production as mitigation for 16 miles of habitat loss would continue, but also exacerbates fish disease issues. For resident fish in the Hydroelectric Reach, the current adverse effects of peaking and those of entrainment into hydroelectric facilities would continue.

Implementation of TMDLs in Oregon and California over the next 50 years would be expected to help alleviate some of basin-wide water quality problems, although the implementation and timing of TMDL-related actions is unknown and effective improvements could take decades to achieve. Furthermore, to date there are no proposed management actions that would achieve the temperature allocations assigned to Copco 1 and Iron Gate reservoirs under the TMDLs. The effects of climate change over the next 50 years could dampen potential benefits from TMDLs, which would continue current conditions responsible for depressed populations of certain species like Chinook or steelhead and would reduce opportunities to improve survival of ESA-listed fish.

As the FERC relicensing process would continue following a Negative Determination on dam removal from the Secretary, Alternative 1 is not likely to continue as the status quo; however, if a new long-term FERC license is issued, it would be contingent on facility operations being compliant with all other applicable laws and regulations, including the Clean Water Act and the Endangered Species Act, making it difficult to predict when a new license might be implemented. For this analysis, the assumption for the next 50 years is that all the dams and the associated reservoirs remain and continue to operate under annual licenses and without construction of any new fish passage facilities. This would preserve the existing hydroelectric power generation capacity and allow use of reservoirs and peaking flows for recreational purposes (the significance of these effects is analyzed in Sections 3.18 and 3.20, respectively). The recreational value of these reservoirs, however, has been diminished in recent years (since 2005) due to the documented growth of toxic algae in Copco 1 and Iron Gate reservoirs and health advisory postings to that effect, a condition that can be expected to persist in the future without significant progress on nutrient reduction in the reservoirs such as through the TMDL process.

Alternative 1 would not result in the short-term negative impacts related to construction activities or short-term impacts to fish from the downstream transport of sediment during reservoir drawdown. Also Alternative 1 does not include the full implementation of KBRA. The ongoing resource management activities, ongoing Interim Measures, TMDLs, biological opinions, and other regulatory conditions described for this alternative would also occur under Alternatives 2, 3, 4, and 5.

5.7.3 Alternative 4 (Fish Passage at Four Dams Alternative)

Alternative 4 would require the long-term licensure of the Hydroelectric Project by FERC to a Hydropower Licensee; although, it is assumed that operations of the Four Facilities would change in response to DOI mandatory flow conditions and DOC and DOI fishway prescriptions. Alternative 4 would eventually result in the same benefits to water quality from TMDL implementation as Alternative 1; however the same limitations on achieving water quality objectives in the Hydroelectric Reach and downstream also apply. Specifically, there are no proposed management actions that would achieve the temperature allocations assigned to Copco 1 and Iron Gate reservoirs under the TMDLs, and control of toxic blooms of cyanobacteria would not be expected to diminish in the future without significant progress on nutrient reduction in the reservoirs, which could

take decades to achieve. The creation of volitional fish passage for salmonids at each of the Four Facilities under this alternative would provide access to at least 420 miles of historical habitat above Iron Gate Dam to anadromous fish. Consequently, the size and diversity of these populations would increase. Implementation of Alternative 4 and access to Upper Basin habitat would reduce the concentration of fish carcasses which are linked to the transmission of fish disease from adult salmon to juvenile salmon. In addition, fish would gain access to cold water springs, particularly in the Upper Basin, offering some protection against the predicted future changes associated with climate change and improved winter growth opportunities for rearing fish. The adverse effects of peaking would be largely eliminated (only one day a week) and those of entrainment into hydroelectric facilities would be largely eliminated.

Iron Gate Hatchery would continue to mitigate for the loss of production of salmonids from the 16 miles of habitat lost between Iron Gate and Copco 2 dams.

NOAA Fisheries Service and DOI prescriptions include a measure to trap and haul fall-run Chinook salmon upstream and downstream around Keno Impoundment. The prescriptions call for seasonal trap and haul operations from June 15 to November 15 when water quality conditions are not suitable for fish (dissolved oxygen concentration less than 6 mg/l or temperature above 20 degrees Celsius) (DOI 2007; NOAA Fisheries Service 2007).

For this analysis over the next 50 years, Alternative 4 retains the majority (80%) of hydroelectric power generation capacity and project reservoirs would remain in place and would continue to be used for recreational purposes (the significance of these effects is analyzed in Sections 3.18 and 3.20, respectively). Alternative 4 would not result in short-term impacts to fish from downstream transport of sediment during reservoir drawdown and dam removal.

5.7.4 Alternative 5 (Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate)

Alternative 5 would result in the same benefits as Alternative 4 for anadromous fish; however, removal of Copco 1 and Iron Gate Dams would provide additional benefits. Fish would be able to migrate upstream and downstream more efficiently through a greater length of natural river channel and through fewer constructed fish passage facilities to use habitat in the Upper Basin. Alternative 5 would create access to at least 420 miles of historical habitat above Iron Gate Dam for anadromous fish. This would include access to low gradient historical habitat of critical importance to spawning and rearing under Copco 1 and Iron Gate Reservoirs. This additional habitat would facilitate greater dispersion of spawning adult salmonids than under Alternative 4, thereby reducing the incidence of disease. Disease risks to resident fish would be low and the establishment of a disease hot spot for *C. shasta* above the current location of Iron Gate Dam would be unlikely. In addition, fish would gain access to cold water springs, particularly in the Upper Basin, offering improved winter growth opportunities for

rearing fish and some protection against future changes associated with climate change. The adverse effect of peaking flows, stranding, and entrainment of fish into hydroelectric facilities would also be eliminated.

The Hydropower Licensee would continue to fund operating Iron Gate Hatchery to meet current mitigation requirements until Iron Gate Dam is removed, after which time the hatchery would not be funded by Hydropower Licensee and is assumed to be closed.

NOAA Fisheries Service and DOI prescriptions would also be applicable to Alternative 5. Therefore Alternative 4 and 5 include a measure to trap and haul fall-run Chinook salmon upstream and downstream around Keno Impoundment. The prescriptions call for seasonal trap and haul operations from June 15 to November 15 when water quality conditions are not suitable for fish (dissolved oxygen concentration less than 6 mg/l or temperature above 20 degrees Celsius) (DOI 2007; NOAA Fisheries Service 2007).

By removing the two largest reservoirs in the Hydroelectric Reach, many of the water quality impairments caused by impounding water, including high pH, altered patterns for water temperatures, elevated water temperatures in the fall, low dissolved oxygen, and the presence of algal toxins, would be largely eliminated within and below the Hydroelectric Reach.

While water quality problems would improve as a result of draining Copco 1 and Iron Gate reservoirs, Alternative 5 would also eliminate recreational uses such as flatwater fishing in these reservoirs and could decrease the value of property with access to, or views of, the reservoirs. Decreased recreational opportunities could have related effects on other resources analyzed in this EIS/EIR (i.e., Socioeconomics and Recreation, analyzed in detail in Sections 3.15 and 3.20, respectively).

The release of sediments stored behind Copco 1 and Iron Gate dams would have negative impacts on fish and water quality in the short term (< 2 years) but would provide longer term benefits in the form of increased habitat complexity and increased movement of larger sediment substrate along the river bed (bedload transport), reductions in fish disease, and the nearly complete elimination of toxic algal blooms in the Hydroelectric Reach and downstream. Some chemicals are present in reservoir sediments at concentrations below critical screening levels for freshwater and marine disposal and do not preclude sediment release downstream.

Removal of Copco 1 and Iron Gate dams and the loss of peaking flows at J.C. Boyle Dam would significantly decrease the amount of hydroelectric power generated by the Klamath Hydroelectric Project. However this alternative does maintain reservoir recreation opportunities at J.C. Boyle Reservoir.

5.7.5 Alternatives 2 (Full Facilities Removal of Four Dams [Proposed Action]) and Alternative 3 (Partial Removal of Four Dams)

Alternatives 2 and 3 would have the benefits of Alternatives 4 and 5 for anadromous fish; however, Alternatives 2 and 3 would provide additional fisheries and water quality

benefits. Table 5-5 below summarizes the expected major benefits to salmonids and water quality for all five alternatives in this EIS/EIR as compared to existing conditions.

Table 5-5. Summary of Major Long-term Benefits for Salmonid Restoration and Water Quality

Major long-term benefits of alternatives for water quality and salmonids as compared to existing conditions (baseline)	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Water Quality Benefits				
River no longer exceeds OR and CA water temperature, nutrient, dissolved oxygen, pH, and chlorophyll-a TMDL allocations (may not occur by 2061), improving water quality basin wide	X ¹	X	X	X
Accelerates when river no longer exceeds OR and CA water temperature, nutrient, dissolved oxygen, pH, and chlorophyll-a TMDL allocations through the KBRA Fisheries Restoration Plan, improving water quality basin wide		X		
Largely eliminates in 2020 elevated late summer/fall water temperatures in and below the Hydroelectric Reach by removing the largest reservoirs		X		X
Largely eliminates 2020 dissolved oxygen and pH problems produced in reservoirs in the Hydroelectric Reach and transported downstream		X		X
Largely eliminates in 2020 algal toxins produced in the Hydroelectric Reach and transported downstream ³		X		X
Salmonid Benefits				
Iron Gate hatchery smolt production as mitigation for 16 miles of habitat loss would continue	X		X	
Expands access to at least 420 miles of anadromous salmonid habitat and associated smolt production above Iron Gate Dam and development of diverse life histories		X	X	X
Anadromous fish would access low gradient historical habitat of critical importance to spawning and rearing under Copco 1 and Iron Gate Reservoirs		X		X
Provides fish with access to thermal refuge areas that are buffered from future effects from climate change		X	X	X
Provides for natural recruitment of spawning gravel and river processes within and below the Hydroelectric Reach through dam removal		X		Partial ²

Table 5-5. Summary of Major Long-term Benefits for Salmonid Restoration and Water Quality

Major long-term benefits of alternatives for water quality and salmonids as compared to existing conditions (baseline)	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Accelerates in 2012 restoration of fish habitat throughout the basin through the KBRA Fisheries Restoration Plan		X		
Accelerates the reintroduction of anadromous fish through the KBRA Fisheries Reintroduction Plan and is consistent with the optimal production from habitat for these species		X		
Expands opportunity to create springtime flushing flows (KBRA Environmental Water Program) and to increase flow variability and bed movement (with dam removal), which reduce juvenile salmon disease below the Hydroelectric Reach		X		Partial
Provides opportunity to reduce juvenile salmon disease by allowing volitional fish passage through the Hydroelectric Reach and decreasing crowding of adult salmon/carcasses		X	X	X
KBRA funding would increase habitat restoration funding, coordination, and monitoring in the Klamath River watershed.		X		
Improves survival of smolts emigrating from tributaries downstream from Iron Gate Dam, such as the Scott and Shasta rivers, where extensive investment in restoration is underway and continuing		X	Partial	Partial
Provides volitional fish passage through the Hydroelectric Reach		X	X	X
Provides optimal efficiency beginning in 2020 of upstream and downstream salmonid migration through the Hydroelectric Reach by creating a free-flowing river		X		
Accelerates the effective use of the Upper Basin by salmonids through the KBRA Fisheries Reintroduction and Management Plan		X		
Improves base flows for salmonids, particularly in drought years, through KBRA Water Resources Program		X		
Eliminates adverse effects of hydroelectric peaking and stranding of fish in the Hydroelectric Reach		X	Partial	X
Eliminates entrainment mortality of resident fish		X	X	X

Table 5-5. Summary of Major Long-term Benefits for Salmonid Restoration and Water Quality

Major long-term benefits of alternatives for water quality and salmonids as compared to existing conditions (baseline)	Alternative 1	Alternatives 2 and 3	Alternative 4	Alternative 5
Reduces concentration of myxospores associated with carcasses accumulating below hatchery facilities, thus reducing disease		X		X

¹“X” means the alternative provides this benefit.

²“Partial” means the alternative provides only some of the benefit.

³ Periphyton are algae that grow attached to rocks and other substrates on a riverbed. Although sometime these species cause nuisance conditions, they are rarely considered toxic. Increased non-toxic periphyton biomass would not lead to increases in algal toxins in the Klamath River. Blooms of phytoplankton (suspended algae) occurring in the calm, lake-like waters are responsible for the production of algal toxins, such as microcystin, in the Klamath River downstream from Iron Gate Dam. Noxious phytoplankton would not thrive in the free flowing river following dam removal.

All action alternatives would provide access to at least 420 miles of historical habitat above Iron Gate Dam for anadromous fish. Additionally under Alternatives 2 and 3, anadromous fish would access low gradient historical habitat of critical importance to spawning and rearing under Copco 1 and Iron Gate Reservoirs. Consequently, the size and diversity of these populations would increase. Removing all Four Facilities would provide for a free-flowing river below Keno dam and would optimize the efficiency of fish migration to and from the Upper Basin as well as through the entire Hydroelectric Reach. In addition, fish would gain access to cold water springs in the Hydroelectric Reach and the Upper Basin, offering improved winter growth opportunities for rearing and some protection against future changes associated with climate change. The entire river from Keno Dam to the Pacific Ocean would become a well-connected, free-flowing river and would provide new fish habitat in the Hydroelectric Reach. Dam removal would maximize the recruitment of gravel within and below the Hydroelectric Reach, which would benefit fish spawning and rearing. Additionally, Alternatives 2 and 3 would create a more natural flow pattern and more bedload transport. The occurrence of juvenile salmon fish disease is anticipated to be reduced as a result of changes in the overall dispersal of adult salmon carcasses, increases in bedload and sediment transport, and reductions in food resources for the intermediate fish disease host. While there is some uncertainty associated with the cycle of disease in juvenile salmon, a reduction in fish disease is likely and this would create better conditions for fish migration, rearing, and spawning. These alternatives would likely eliminate concentrations of carcasses and disease issues associated with Iron Gate Hatchery. Similarly to Alternative 5, the adverse effects of peaking and entrainment into hydroelectric facilities would also be eliminated. Disease risks to resident fish would be low and the establishment of a disease hot spot for *C. shasta* above the current location of Iron Gate Dam would be unlikely. Also, Alternatives 2 and 3 include implementation of all Interim Measures funded by PacifiCorp for the period 2012 through 2020 to improve fish habitat, water quality, and to fund monitoring and critical research.

Similarly to Alternative 5, the release of sediments stored behind Copco 1 and Iron Gate dams would have negative impacts on fish and water quality in the short term (< 2 years) but would provide longer term benefits in the form of increased habitat complexity and increased movement of larger sediment substrate along the river bed (bedload transport), reductions in fish disease, and the nearly complete elimination of toxic algal blooms in the Hydroelectric Reach and downstream. Some chemicals are present in reservoir sediments but at concentrations below critical screening levels for freshwater and marine disposal and do not preclude sediment release downstream.

Alternatives 2 and 3 would eliminate the recreational benefits of project reservoirs such as fishing and some white water recreation opportunities related to peaking flows in the Hydroelectric Reach; however partial and full facilities removal would create new recreational benefits along the Hydroelectric Reach including additional river access and rafting opportunities in the bypassed reaches (the significance of these effects is analyzed in Section 3.20). Because of the elimination of the reservoirs and changes to recreational amenities, Alternatives 2 and 3 would decrease the value of properties with access to or views of the reservoirs. Alternatives 2 and 3 eliminate all hydropower production from the Four Facilities beginning in 2020.

Implementation of KBRA projects and programs under Alternatives 2 and 3 would accelerate basin-wide habitat restoration for fish and accelerate improvement of basin-wide water quality. In the Upper Basin, the KBRA would support water quality improvements in Upper Klamath Lake and Keno Reach, which would benefit migrating salmon and steelhead populations and resident sucker populations in Upper Klamath Lake. The KBRA Fisheries Reintroduction and Management Plans could have direct benefits for salmon by accelerating their reintroduction to the Upper Basin and by providing for fish population monitoring to optimize adaptive management of restoration activities.

Within six months of an Affirmative Determination by the Secretary of the Interior, PacifiCorp would propose a post Iron Gate Dam Mitigation Hatchery Plan that would ensure hatchery mitigation goals are met for eight years following dam removal. After eight years, continued hatchery operations would depend largely on: 1) realized and projected benefits of restored access to additional habitat above the current location of IGD; 2) the success of habitat restoration efforts through the KBRA; and 3) the success of the reintroduction program identified in the KBRA.

Following dam removal seasonal trap and haul operations, primarily for fall-run Chinook salmon may occur around Keno Dam until water quality conditions are sufficiently improved. A variety of release and rearing strategies would be utilized to optimize success; however, the KBRA does not contain specifics on what those strategies might include.

Effects downstream from Iron Gate Dam would include increased production of Chinook salmon due to more favorable flows associated with KBRA and improved habitat condition. In particular, these alternatives would also improve survival of smolts

emigrating from downstream tributaries, such as the Scott and Shasta rivers, due to improved Klamath River flows and disease conditions. Restoration of runs in these two tributaries is the goal of extensive restoration programs.

Both Alternatives 2 and 3 fulfill three key criteria described in the Purpose and Need (Sections ES.3 and 1.5.2.1):

- Establishes a free-flowing condition on the Klamath River from the Keno Dam (River Mile 240) to the Pacific Ocean.
- Allows for full volitional fish passage from the Upper Basin to the Lower Basin of the Klamath River.
- Leads to implementation of KBRA.

Alternatives 2 and 3 have effectively the same in-river effects (i.e. fisheries, habitat, or water quality); any differences between these alternatives are related to societal aspects (scenic, economic, or recreation), as described in Section 5.7.6.

5.7.6 Comparing Alternatives 2 and 3

There are many similarities in the benefits and potential impacts of Alternatives 2 and 3. The main difference between the alternatives is that Alternative 3 would leave some ancillary structures in place, such as powerhouse buildings, pipelines, and penstocks, but both alternatives would create a free-flowing river from Keno Dam to the Pacific Ocean and eliminate any passage barriers to fish on the main stem Klamath River.

Given the fact that fewer structures would be removed under Alternative 3 compared to Alternative 2, there would be fewer short-term environmental impacts associated with construction activities and the use of heavy equipment. Thus, impacts related to the release of greenhouse gases, noise, and ground and land disturbance would be diminished and there would be less likelihood of displacing cultural resources or human remains (impacts to Cultural Resources are analyzed in Section 3.13). However, leaving various ancillary structures in place has the potential to interfere with wildlife movement, aesthetic quality, public safety, and would require some level of long-term maintenance.

Table 5-6 (also Executive Summary, Table ES-7) below compares the effect of Alternative 2 and 3 for all resource categories in this EIS/EIR.

Table 5-6. Detailed Comparison of Alternative 2 and Alternative 3

Resource Category:	Alternative 2 (Alt 2) - Full Facilities Removal	Alternative 3 (Alt 3) - Partial Facilities Removal
Water Quality (Section 3.2)	Both Alt 2 and Alt 3 result in a sediment release from reservoir drawdown which will have similar short-term water quality impacts. In the long term, both Alt 2 and Alt 3 would result in increased spring time water temperatures and changes in daily variation in water temperature. These changes would mean that water temperature patterns in the Klamath River would be restored to normal pre-dam conditions.	

Table 5-6. Detailed Comparison of Alternative 2 and Alternative 3

Resource Category:	Alternative 2 (Alt 2) - Full Facilities Removal	Alternative 3 (Alt 3) - Partial Facilities Removal
Aquatic Resources (Section 3.3)	Both Alt 2 and Alt 3 result in a sediment release from the drawdown of the reservoir which will have similar short-term aquatic resource impacts. In the long term, the increase in the total amount of habitat, reestablishment of bedload sediment transport, reduced transmission of disease, and the improvements in water quality condition will benefit aquatic resources.	
Algae (Section 3.4)	Both Alt 2 and Alt 3 result in increased spring time water temperatures and change daily variation in water temperature. These changes would mean that water temperature patterns in the Klamath River Hydroelectric Reach would be restored to more natural conditions. Similarly the dominant algae would shift from noxious, and at times toxic, lake algae to algae found in moving water.	
Terrestrial Resources (Section 3.5)	Short-term construction impacts to terrestrial resources from Alt 2 maybe higher due to effects from more truck trips and reduction in bat habitat.	Reduced impacts to terrestrial plants and wildlife through reduced construction truck trips. Retained structures for use as a bat habitat.
Flood Hydrology (Section 3.6)	Both Alt 2 and Alt 3 result in a small increase in the peak 100 year flood and change in flood timing. However with mitigation this impact is less than significant.	
Ground Water (Section 3.7)	The dam removal and drawdown described in both Alt 2 and Alt 3 have a decline in the water table surrounding the reservoirs potentially affecting adjacent wells. However with mitigation this impact is less than significant.	
Water Rights/Water Supply (Section 3.8)	Both Alt 2 and Alt 3 result in a sediment release which has a similar very slight impact on water supply in-takes located in the Klamath River downstream from Iron Gate Dam. However with mitigation this impact is less than significant. Removal of the Four Facilities would also require the relocation of the City of Yreka's water supply pipeline. The programmatic analysis of this action showed that design measures incorporated into the project description reduce the potential effects of this action to a less than significant level. Additional environmental compliance will be required for the pipeline relocation.	
Air Quality (Section 3.9)	Greater emissions from short-term construction activities.	Reduced VOC, NOx, CO, SO2, PM10 and PM2.5 emissions due to shorter duration construction activities.
Greenhouse Gases/Climate Change (Section 3.10)	Greater emissions from short-term construction activities.	Short-term reduction in greenhouse gas emissions due to reduced construction activities.
Geology, Soils, and Geologic Hazards (Section 3.11)	The dam removal and drawdown described in both Alt 2 and Alt 3 could cause instability surrounding the reservoirs. However with mitigation this impact is less than significant.	
Tribal Trust (Section 3.12)	Both Alt 2 and Alt 3 result in benefits to aquatic resources and water quality which benefit Indian Trust Assets.	
Cultural/Historic Resources (Section 3.13)	Greater disturbance to archaeological and historic sites given wider and deeper APE footprint. No retention of historic structures.	Reduced disturbance to archaeological and historic sites given less aerial extent of excavation. Some historic structures at Copco 1 (built in 1918) are retained.

Table 5-6. Detailed Comparison of Alternative 2 and Alternative 3

Resource Category:	Alternative 2 (Alt 2) - Full Facilities Removal	Alternative 3 (Alt 3) - Partial Facilities Removal
Land Use, Agricultural, and Forest Resources (Section 3.14)	Slightly more open space for public use through removal of all facilities; however buried facilities may have some associated access restrictions.	Slightly less open space for public use; retained facilities will be fenced off from public use limiting access to some additional areas.
Socioeconomics (Section 3.15)	<p>Fisheries: Improvements to commercial, recreational and tribal fisheries due to habitat expansion and improvement.</p> <p>Community economic impacts (employment, labor income, output): Positive short- and medium-term impacts due to construction, mitigation and KBRA expenditures. Some long-term negative impacts due to reduced expenditures for reservoir and whitewater recreation and dam operations and maintenance. Some long-term positive impacts due to increased expenditures for commercial and recreational fisheries, irrigated agriculture, and refuge recreation.</p> <p>Tribes: Improvements to tribal fisheries and to cultural practices involving fish or water contact.</p> <p>Costs: Most probable estimate of construction and mitigation costs (2020 dollars) = \$292 million. Costs to be divided between PacifiCorp ratepayers (\$200 million) and State of California. KBRA is connected action which will require Federal funding.</p>	<p>Fisheries: Same as Alt 2.</p> <p>Community economic impacts (employment, labor income, output): Same as Alt 2</p> <p>Tribes: Same as Alt 2.</p> <p>Costs: Most probable estimate of construction, life cycle and mitigation costs (2020 dollars) = \$247 million. Life cycle costs pertain to perpetual maintenance and security for appurtenant facilities that are not removed. Costs to be divided between PacifiCorp ratepayers (\$200 million) and State of California. KBRA costs are the same as Alt 2.</p>
Environmental Justice (Section 3.16)	Greater traffic, noise, and vibration could disproportionately effect tribal communities.	Reduced traffic, noise, and vibration could reduce disproportionate effects.
Population & Housing (Section 3.17)	The availability of housing is slightly reduced during construction. However because Alt 2 and Alt 3 have identical peak worker totals the effects are similar.	
Public Utilities (Section 3.18)	Higher volume of construction waste for disposal which would result in greater effects on area landfills.	Lower volume of construction waste for disposal which would result in reduced effects on area landfills.

Table 5-6. Detailed Comparison of Alternative 2 and Alternative 3

Resource Category:	Alternative 2 (Alt 2) - Full Facilities Removal	Alternative 3 (Alt 3) - Partial Facilities Removal
Public Safety (Section 3.18)	Slightly more short-term public safety effects associated with greater traffic. No retained above ground structures improves public safety in the long term.	Reduced traffic would reduce the public safety effects from short-term construction traffic. Under Alt 3 in the long term, there is the risk that facilities that were secured in place could cause an attractive nuisance and public safety effects. Resolving an attractive nuisance issue would fall to the entity ultimately responsible for management of those lands.
Scenic Quality (Section 3.19)	Removal of all structures could improve scenery however some historic properties provide positive scenery attributes.	Retaining some structures could conflict with the surrounding terrain, however some historic properties provide positive scenery* attributes.
Recreation (Section 3.20)	Removal of JC Boyle dam will permanently reduce the number of days with acceptable flows for whitewater boating at Hell's Corner Reach. Both Alt 2 and Alt 3 result in the elimination of reservoir related recreation.	
Toxic/ Hazardous Materials (Section 3.21)	Both Alt 2 and Alt 3 require disposal of a similar amount of hazardous materials.	
Traffic and Transportation (Section 3.22)	Greater traffic and road wear generation.	Reduced traffic and road wear generation due to reduced construction activities
Noise and Vibration (Section 3.23)	Greater noise and vibration generation.	Reduced noise and vibration generation due to reduced construction activities
Color Code Description Key	Less preferred condition for this resource category	Preferred condition for this resource category

5.8 NEPA Environmentally Preferable and Preferred Alternative

5.8.1 NEPA Environmentally Preferable Alternative

NEPA requires that DOI identify the alternative or alternatives that are environmentally preferable in the Record of Decision (ROD) (40 CFR Part 1505.2(b)). The environmentally preferable alternative generally refers to the alternative that would result in the fewest adverse effects to the biological and physical environment. It is also the alternative that would best protect, preserve, and enhance historic, cultural, and natural resources. Although this environmentally preferable alternative must be identified in the ROD, it need not be selected for implementation.

5.8.2 Preferred Alternative

Both Alternative 2 and Alternative 3 include removal of the Four Facilities and implementation of KBRA and both alternatives more fully meet the Purpose and Need (Sections ES.3 and 1.5.2.1). Some key benefits provided by implementation of Alternative 2 and Alternative 3 include (for a full discussion of the Alternatives, see Chapter 3):

- Provides optimal anadromous fish passage to and from at least 420 miles of historical habitat above Iron Gate Dam by creating a free flowing river in the Hydroelectric Reach in 2020
- Anadromous fish would access low gradient historical habitat of critical importance to spawning and rearing under Copco 1 and Iron Gate Reservoirs
- Provides for natural recruitment of spawning gravel and river processes within and below the Hydroelectric Reach through dam removal
- Largely eliminates in 2020 elevated late summer/fall water temperatures in and below the Hydroelectric Reach by removing the largest reservoirs
- Largely eliminates 2020 dissolved oxygen and pH problems produced in reservoirs in the Hydroelectric Reach and transported downstream
- Largely eliminates in 2020 algal toxins produced in the Hydroelectric Reach and transported downstream
- Reduces concentration of myxospores associated with carcasses accumulating below hatchery facilities, thus reducing disease

Removal of the Four Facilities and implementation of KBRA are important components of a durable, long-term solution for local communities and tribes regarding the development, administration, allocation, and advancement of water and native fishery resources of the Klamath Basins. Alternative 2 and Alternative 3 provide a greater opportunity for expanding restoration of salmonids, which, over time would improve harvest opportunities of salmonids, and when compared to the other alternatives, resolve more societal hardships and conflicts that result from over-allocation of scarce natural resources.

Although Alternative 2 and Alternative 3 are similar, Alternative 2 would remove nearly all structures associated with the Four Facilities, while Alternative 3 would allow some structures to remain. By leaving no structures along the shore of the Klamath River, Alternative 2 leads to positive permanent changes in the human environment such as improvements to scenic quality, less long-term maintenance by land-management agencies, and is more protective of public safety. For these reasons Alternative 2 is the preferred alternative.

5.9 CEQA Environmentally Superior Alternative

Section 15126.6(e)(2) of the CEQA Guidelines requires agencies to identify the environmentally superior alternative in a Draft EIR. If the No Project Alternative is the

environmentally superior alternative, an additional environmentally superior alternative must be identified among the other alternatives.

CDFG has identified Alternative 3 (Partial Facilities Removal of Four Dams) as the environmentally superior alternative. All of the alternatives evaluated in the EIS/EIR, including for the No Action/No Project Alternative, have significant unavoidable environmental impacts as identified in Section 5.5. Alternative 2 (Full Facilities Removal of Four Dams, the Proposed Action), Alternative 3, and Alternative 5 (Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate) would have the most short-term significant and unavoidable impacts among the alternatives. These impacts would largely be limited to the time frame of direct dam deconstruction actions and sediment release. After dam deconstruction, impacts would include the loss of reservoir recreation and local economic impacts. Alternatives 2, 3, and 5 would significantly improve water temperature, dissolved oxygen, and algal toxins for aquatic resources and reduce the incidence of fish disease in juvenile salmon by removing the two largest reservoirs—Copco I and Iron Gate. Alternatives 4 and 5 would maintain some power production and recreational benefits thereby reducing local economic impacts.

Although the No Action/No Project Alternative will have no change from existing conditions resulting from construction, this alternative is not the environmentally superior alternative when compared to the Proposed Action, which is intended to improve environmental conditions. Alternative 3 is the environmentally superior alternative when compared with the Proposed Action (Alternative 2) because it would:

- Reduce the air quality impacts from emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter < 10 microns (PM₁₀), and particulate matter < 2.5 microns (PM_{2.5}) from reduced construction activities;
- Reduce the contribution to greenhouse gas emissions from reduced construction activities;
- Reduce noise and vibration from reduced construction activities;
- Reduce impacts to terrestrial plants and wildlife from fewer truck trips;
- Reduce disturbance to archaeological and historic sites from fewer truck trips;
- Retain structures for roosting bats; and
- Retain some historically significant structures at the Four Facilities.

Alternative 3 would provide similar long-term benefits when compared with Alternative 2, but would reduce some short-term and long-term impacts because it involves less construction. In summary, Alternative 3 is considered the environmentally superior alternative among all the alternatives because it provides long-term beneficial environmental effects, while reducing some of the short-term significant effects of the Proposed Action (Alternative 2).

5.10 Controversies and Issues Raised by Agencies and the Public

CEQA requires disclosure of the controversial project issues raised by agencies and the public. Table 5-7 (also Executive Summary, Table ES-8) presents a summary of some of the controversial issues and the timeline or process in which they will be addressed, or the document in which they are addressed. The issues were identified during the scoping period and in other forums for public involvement. These are opinions and issues raised by agencies and members of the public and do not necessarily represent the position of the Lead Agencies. Additionally, Table 5-7 is not a summary of findings or determinations from the analysis in this EIS/EIR. See the Scoping Report (located online at: <http://klamathrestoration.gov/>) for further information on issues identified by agencies and the public during the public scoping process (DOI 2010).

Table 5-7. Summary of Controversies and Issues Raised by Agencies and the Public

Issue	Summary of Issue	Timeline for Addressing or Document/Section Addressing Issue
Loss of Renewable Power Supply	Loss of the Klamath Hydroelectric Project will result in the loss of renewable power. The specific makeup of new power supplies is not certain and may come from non-renewable sources.	Greenhouse Gases/Global Climate Change (3.10.4.3) Public Health and Safety, Utilities and Public Services, Solid Waste, Power (Section 3.18.4.3)
Regional Economic Impacts	Loss of the Klamath Hydroelectric Project, lost power generation, and impacts to the local real estate market will negatively and disproportionately affect resource-based economies of local communities, many of which are struggling economically.	Socioeconomics (Section 3.15.4.3)
Sediment Impacts from Dam Removal	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.	Water Quality (Section 3.2.4.3) Aquatic Resources (Section 3.4.3) Appendix C
Historic Anadromous Fish Distribution in the Upper Klamath Basin	Dam removal would open large areas of the Upper Klamath Basin watershed to anadromous fish. The historical distribution of anadromous fish above the dams has been questioned.	Chapter 1, Introduction Aquatic Resources (Section 3.3.4.3)

Table 5-7. Summary of Controversies and Issues Raised by Agencies and the Public

Issue	Summary of Issue	Timeline for Addressing or Document/Section Addressing Issue
KBRA Effects	The KBRA may not produce enough social and economic benefits from implementation.	Socioeconomics (Section 3.15.4.3)
KBRA Effects on Environmental Justice and Federal Trust Responsibilities	The KBRA would result in the "termination" of tribal fishing and water rights and the Federal trust responsibilities for those rights and resources, further exacerbating the environmental justice issues associated with declining anadromous fisheries and water quality in the Klamath Basin that have affected tribal practices, health, and cultural traditions	Water Rights and Water Supply (Section 3.8) Indian Trust Assets(Section 3.16)
Loss of Reservoir Environment	Dam removal will result in a loss of the three largest reservoirs, affecting individuals that live on or near the reservoirs and who value the reservoirs' aesthetic and recreational value.	Land Use, Agricultural, and Forest Resources (Section 3.14.4.3) Scenic Quality (Section 3.19.4.3) Recreation (Section 3.20.4.3)
Flood Risk	Dam removal will increase the incidence and magnitude of flooding to downstream communities.	Flood Hydrology (Section 3.6.4.3)
FERC Relicensing	In the event of a Negative Secretarial Determination, PacifiCorp would continue to seek a new license from FERC for operation of the Klamath Hydroelectric Project. The outcome of this process is not known but could be the continued operation of the dams under a new license that includes the agencies' mandatory conditions and prescriptions.	Chapter 2, Proposed Action and Description of Alternatives
Agriculture and Refuge Management contributes to poor water quality in Keno and Upper Klamath Lake	Runoff from agriculture and refuges results in poor water quality in Keno Impoundment/Lake Ewauna and in the mainstem Klamath River. This causes fish stress, disease and mortality. Continued farming and ranching in the Tule Lake National Wildlife Refuge and Lower Klamath Lake National Wildlife Refuge under the KBRA would inhibit fish species reintroduction and survival.	Water Quality (Section 3.2.4.3) Aquatic Resources (Section 3.3.4.3)
Water Quality Conditions in Keno and Upper Klamath Lake would not allow sound fish passage.	Low levels of dissolved oxygen and high water temperatures during certain times of year would adversely affect passage of fish through Keno Impoundment/Lake Ewauna and Upper Klamath Lake.	Water Quality (Section 3.2.4.3) Aquatic Resources (Section 3.3.4.3)
Changes in 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.	Socioeconomics (Section 3.15.4.2) Recreation (Section 3.20.4.3)

Table 5-7. Summary of Controversies and Issues Raised by Agencies and the Public

Issue	Summary of Issue	Timeline for Addressing or Document/Section Addressing Issue
Resolution 10-185 of Siskiyou County Board of Supervisors Calling for an Advisory Election with Respect to the Removal of the Dams on the Klamath River on November 2, 2010 (Measure G).	Siskiyou County held an advisory vote on November 2, 2010 regarding dam removal. The ballot asked “ Should the Klamath River Dams (Iron Gate, Copco 1, and Copco 2) and associated hydroelectric facilities be removed – Yes or No?” Of the 25,922 registered voters in the County, 17,206 (66.4%) participated in this vote. The results: Of the 17,206 who voted, 13,566 residents (78.84%) voted No to dam removal, while 3,640 (21.86 %) voted Yes.	While this is not an environmental impact issue and is not specifically addressed as part of this EIS/EIR, the Secretary of the Interior will consider this when making his determination.
"Siskiyou County Water Users Association, Inc. v. California Natural Resources Agency, et al." (Other Defendants are Lester Snow, Secretary of California Natural Resources Agency, Governor Schwarzenegger, DFG, DFG's Director, Humboldt County, Tule Lake Irrigation District, and Westside Improvement District).	This case was originally filed in Sacramento Superior Court on August 16, 2010. The original lawsuit asserted that approval of the KHSA and KBRA violated CEQA, and that DFG is the wrong Lead Agency. The trial court ruled that appellant's claims were time barred because a valid Notice of Determination had been filed, and that a challenge to the Lead Agency designation was not ripe for review. That ruling has been appealed to the Third Appellate District Court of Appeal. Siskiyou County Water Users Association's opening brief was filed on February 15, 2012.	This is not an environmental impact issue and is not specifically addressed as part of this EIS/EIR. It is not yet known how the results of this case may affect the overall project.

¹ CEQA requires disclosure of the controversial project issues raised by agencies and the public. Table 5-7 presents a summary of some of the controversial project issues identified during the scoping period, which are addressed in this EIS/EIR. These are opinions and issues raised by agencies and members of the public and do not necessarily represent the position of the Lead Agencies. Additionally Table 5-7 is not a summary of findings or determinations from the analysis in this EIS/EIR.

5.11 References

Asarian E. 2011. Personal communication via telephone to E. Floyd on 22 February 2011.

Bender Rosenthal, Inc. (BRI). 2011. Dam Removal Real Estate Evaluation Report - 2008 Baseline. Prepared as an appendix to the Klamath Facilities Removal Secretarial Determination Overview Report.

BRI. 2012. Dam Removal Real Estate Evaluation Report – 2006 and 2004 Baselines. Prepared as an appendix to the Klamath Facilities Removal Secretarial Determination Overview Report.

Bureau of Reclamation (Reclamation). 2012a. Benefit Cost and Regional Economic Development Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon. Bureau of Reclamation, Technical Service Center, Denver, CO. Available at: <http://klamathrestoration.gov/keep-me-informed/secretarial-determination/role-of-science/secretarial-determination-studies>.

Reclamation. 2012b. Irrigated Agriculture Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon. Bureau of Reclamation, Technical Service Center, Denver, CO. Available at: <http://klamathrestoration.gov/keep-me-informed/secretarial-determination/role-of-science/secretarial-determination-studies>.

California Air Resources Board (CARB). 2008. Climate Change Scoping Plan: A Framework for Change. December. Available at: <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>. Accessed on: March 22, 2011.

Department of the Interior (DOI). 2007. The Department of the Interior's Filing of Modified Terms, Conditions, and Prescriptions (Klamath Hydroelectric Project, No. 2082). January 26, 2007. Sacramento, CA: 650 p.

DOI. 2010. Scoping Report for the *Environmental Impact Statement/Environmental Impact Report on the Klamath Hydroelectric Settlement Agreement including the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon*. September 2010. Available at: <http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Secretarial%20Determination/Compiled%20Klamath%20Sec.%20Det.%20EIS%20EIR%20Public%20Scoping%20Report.pdf>.

National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. 2007. National Marine Fisheries Service Modified Prescriptions for Fishways and Alternatives Analysis for the Klamath Hydroelectric Project (FERC Project No. 2082). January 26, 2007. Sacramento, CA: 151 p.

Philip Williams & Associates, LTD. (PWA). 2009. A River Once More: The Klamath River Following Removal of the Iron Gate, Copco, and J.C. Boyle Dams. Used with permission from PWA. Prepared for the California State Coastal Conservancy. April 17, 2009.

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. Available at: <http://www.stillwatersci.com/resources/2010SWSklamathdamsedimentdelivery.pdf>. Accessed on: April 1, 2011.