UNITED STATES DEPARTMENT OF THE INTERIOR
COMMENTS, PRELIMINARY RECOMMENDATIONS, TERMS AND CONDITIONS, AND PRESCRIPTIONS FOR FISHWAYS
FILED PURSUANT TO SECTIONS
4(e), 10(a), 10(j), AND 18 OF THE FEDERAL POWER ACT
WITH THE FEDERAL ENERGY REGULATORY COMMISSION
FOR THE KLAMATH RIVER HYDROELECTRIC PROJECT
PROJECT NO. 2082
KLAMATH RIVER, SISKIYOU COUNTY, CALIFORNIA; AND KLAMATH COUNTY, OREGON

March 27, 2006

Introduction Table of Contents

INTRODUCTION

The Department of the Interior (Department) has reviewed the notice of application Ready for Environmental Analysis and Soliciting Comments, Recommendations, Terms and Conditions, and Prescriptions (REA Notice) for the Klamath Hydroelectric Project (FERC No. 2082) (Project), located primarily on the Klamath River in Klamath County, Oregon, and Siskiyou County, California, between Klamath Falls, Oregon, and Yreka, California. The December 28, 2005 REA Notice requested submission of comments, recommendations, terms, conditions, and prescriptions by February 27, 2006. On February 16, 2006 staff of the Federal Energy Regulatory Commission (Commission or FERC) approved an extension of the response deadline to March 29, 2006.

PacifiCorp (Applicant) is seeking a new license for the continued operation of the 161 megawatt (MW) Project. The existing license expired on March 1, 2006, and the Commission issued an annual license on March 9, 2006. The Department and its bureaus (the Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Bureau of Reclamation (Reclamation), National Park Service (NPS), and Fish and Wildlife Service (Service or FWS)) have provided technical assistance and participated on technical subgroups with the Applicant since 2001. The Department also provided the Applicant with comments and recommendations on its Draft License Application (DLA) on September 24, 2003, the Final License Application (FLA) on April 26, 2004, and in many other letters filed with the Commission and hereby incorporated by reference. The Department formally intervened in the proceeding on September 29, 2004.

The preliminary comments, recommendations, terms and conditions, and prescriptions herein are provided in accordance with the provisions of the Federal Power Act (FPA), (16 U.S.C. § 791 *et seq.*), the Fish and Wildlife Coordination Act (FWCA), (16 U.S.C. §661 *et seq.*), the Endangered Species Act (ESA), (16 U.S.C. §1531 *et seq.*), the Federal Land Management and Policy Act (FLPMA), (43 U.S.C. § 1701 *et seq.*), the Klamath River Basin Fishery Resources Restoration Act (Public Law 99-552), the Reclamation Act of 1902 as amended and supplemented (32 Stat. 388), the Outdoor Recreation Act of 1963 (16 U.S.C. 4601-1), the NPS Organic Act (39 Stat. 535), the Wild and Scenic Rivers (WSR) Act (Pub. Law 90-542), the National Trails System Act (16 U.S.C. 1246(a)), the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 *et seq.*), and federal trust responsibilities to Indian Tribes. In this document, the Department identifies and explains these comments, recommendations, terms and conditions, and prescriptions as well as their legal and evidentiary basis:

- **Section A** contains preliminary conditions pursuant to Section 4(e) for the protection and utilization of the BLM reservations.
- **Section B** contains preliminary conditions pursuant to Section 4(e) for the protection and utilization of lands and facilities managed by Reclamation.
- **Section C** contains preliminary prescriptions for the construction, operation, and maintenance of upstream and downstream fishways pursuant to Section 18. These

prescriptions on behalf of the FWS are issued jointly with the National Marine Fisheries Service (NMFS).

- **Section D** contains recommendations to protect, mitigate impacts to, and enhance fish and wildlife resources pursuant to Section 10(j).
- **Section E** contains recommendations to protect fish and wildlife, recreation, cultural, and reservation resources pursuant to Section 10(a).

In addition, the Department is submitting for the record two technical memoranda:

- Ongoing and Future Improvement of Aquatic Habitat in the Klamath River Watershed, FWS, February 27, 2006.
- Replacement Power Values, Office of Policy Analysis, Department of the Interior, March 27, 2006.

The Department notes that the proceeding is behind schedule. PacifiCorp filed its license application on February 25, 2004 without having completed key studies. The Commission issued a Notice of Tendering of Application on February 26, 2004, and in response to that notice, the Department filed additional information requests with the Commission on April 26, 2004. The Commission did not accept the license application until August 16, 2004, and did not issue additional study requests until February 17, 2005. This order called for receipt of all additional information by August 2005. Several of the Applicant's requests for extension were granted, and final studies were not filed on key areas of water quality and fish passage until December 16, 2005. Much of this material is still incomplete, or in a form that is difficult to review and assess. The Department has filed numerous letters with the Commission on the adequacy of the Applicant's studies and information, and hereby incorporates them by reference.

Provided that our comments, recommendations, terms and conditions, and prescriptions are incorporated into the new license, the Department does not intend to object to the issuance of a new license for the Klamath Hydroelectric Project (Project). The conditions and recommendations contained herein are designed to mitigate the impacts of the Project to the fullest extent achievable under the authorities available to the Department bureaus in the traditional relicensing process, and include fish passage measures and controlled operations at the Project dams. The Department recommends that these measures be included in the Commission's NEPA analysis in order to assess their effectiveness in addressing the Project's impacts. However, the full suite of Project impacts may not be addressed through the prescription of fishways and the recommendation of other modifications to Project operations. We are hopeful that more comprehensive solutions can be attained through the ongoing settlement process, in which the Applicant is a participant. In the meantime, we continue to urge the Commission to evaluate a full range of Project alternatives during the environmental review process, including dam decommissioning and removal.

Because a Draft Environmental Impact Statement (DEIS) or Draft Environmental Assessment (DEA) has not yet been issued by the Commission, this response contains preliminary comments, recommendations, terms and conditions, and prescriptions only. The Department reserves the right to amend these preliminary comments, recommendations, terms and

conditions, and prescriptions, if warranted, based on the results of new information and conclusions developed during the Department's processes conducted pursuant to the Energy Policy Act of 2005 (EP Act) and the Commission's environmental analysis.

GENERAL COMMENTS

The Klamath River Basin in southern Oregon and northern California has sustained farming communities, provided habitat for the majority of waterfowl that migrate over the Pacific flyway, and was once the third largest salmon-producing watershed on the west coast, supporting large anadromous fish runs including Chinook salmon, coho salmon, steelhead, sturgeon, and lamprey, which supported significant commercial, recreational, and tribal harvests. Declines in populations for several species of fish have led to the restriction of fishing and tribal harvest, as well as recent reductions in deliveries of water for agricultural use.

The Commission's relicensing process provides an opportunity for government agencies, Indian Tribes, stakeholders, and the public to comprehensively address the effects of the Project on the human environment, bring the Project up to current environmental standards, strike a balance between the various competing uses of public resources, and assist the Commission in making a licensing decision that is in the public interest and based on substantial information. The Department believes that actions taken as a result of this relicensing must contribute to long-term basinwide solutions, particularly to address the Project-caused extirpation of the threatened coho salmon and other trust species such as Chinook salmon from all reaches and tributaries upstream of Iron Gate Dam.

On March 1, 2002, the President established the Klamath River Basin Federal Working Group to advise the President on immediate steps and long-term solutions to enhance water quality and quantity and to address other complex issues in the Klamath River Basin. Since the establishment of the Working Group, which is chaired by the Secretary of the Interior, five of the Department's bureaus, the Office of the Solicitor, and the Office of the Secretary have been heavily involved in activities and issues of concern to Klamath River basin communities, including Indian tribes.

The Governors of the States of California and Oregon, the President's Klamath River Working Group, and the U.S. Environmental Protection Agency signed the Klamath River Watershed Coordination Agreement in October 2004. The agreement is intended to focus science-based attention to identify and address the environmental, economic, agricultural, and Tribal trust needs of the Klamath Basin and its communities. It places a priority on the signatories' Klamath Basin activities and on their coordination and communications with one another and with tribal governments, local governments, private groups and individuals, to resolve water quantity, water quality and fish and wildlife resource problems in the basin.

Long-term solutions in the Basin are a priority for the Department, which has committed significant resources to the effort:

- The Department is committed to finding a long-term resolution to the conflict in the Klamath River basin that will provide water to farmers and Tribes while protecting and enhancing the health of fish populations. Recent budgets reflect commitment to funding habitat restoration, removal of fish migration barriers, land acquisition, and the use of water banking.
- The Department will dramatically increase habitat access for endangered sucker species by removing Chiloquin Dam, which impedes their passage to tributary habitat above Upper Klamath Lake. Removing Chiloquin Dam will improve access to more than 70 miles of the Sprague River, providing endangered suckers and other fish substantially more spawning and feeding areas.
- Reclamation has completed fish screening for the A-Canal, the largest water diversion point for the Klamath Irrigation Project, at a cost of $15 million. The fish screens bypass juvenile fish back to Upper Klamath Lake where physical injury and acute mortality for fish passing through the A-Canal pump bypass appears to be nearly negligible.
- Reclamation has also completed construction of a new fish ladder at Link River Dam at the outlet of Upper Klamath Lake to facilitate upstream passage of endangered suckers. Work will continue on screening other canals and laterals to reduce entrainment of endangered suckers.
- At the request of the Secretaries of the Interior and Commerce, the National Academy of Sciences' National Research Council (NRC) issued a final report in October 2003 that identified potential actions for the recovery of the coho salmon and the Lost River and shortnose suckers (National Research Council 2003). This report evaluated the scientific basis of the 2001 biological assessments and biological opinions on the three listed species, and identified potential actions for their recovery (National Research Council 2003). The NRC report is a timely and useful summary of what is known and what remains to be learned regarding the causes of decline and recovery strategies for the three listed species. The NRC report recommends a systematic and coordinated basinwide approach to ecological restoration and management, and urges that new information be collected and used to improve management decisions, including a serious evaluation of the benefits to coho salmon from elimination of Iron Gate Dam.
- Reclamation, in partnership with the Service, BIA, NMFS, the Natural Resource Conservation Service (NRCS), the States of Oregon and California, Klamath basin tribes, and other stakeholders in the basin, is leading an effort to develop a Klamath River Basin Conservation Implementation Program (CIP). The goals of the CIP are: 1) to largely restore the Klamath River ecosystem to achieve recovery of the Lost River and shortnose suckers, and to substantially contribute to the recovery of threatened coho salmon; 2) to contribute to the fulfillment of the Federal government's trust responsibilities to Indian tribes; and 3) to allow continued sustainable operation of existing water management facilities and future water resource improvements for human use in the Klamath Basin. The CIP was modeled after similar programs successfully being used in other river basins, such as the Upper Colorado River basin.

In addition, the Department is engaged on the question of mainstem Klamath River flows in two other forums. First, Reclamation must maintain certain lake elevations and river flows through

Biological Opinions issued by the U.S. Fish and Wildlife Service with respect to elevations in Upper Klamath Lake for ESA listed sucker fish and by the National Marine Fisheries Service with respect to Klamath River flows below Iron Gate Dam for coho salmon. Consistent with these Biological Opinions, Reclamation must also operate the Klamath Reclamation Project--including the water available in Upper Klamath Lake and the release of flows from Link River Dam into the Klamath River—consistent with its tribal trust obligations, contracts for the delivery of water for irrigation within the Reclamation project, and water supply to the Lower Klamath and Tule Lake National Wildlife Refuges.

Second, the State of Oregon is now conducting a water rights adjudication to determine the relative rights to the surface waters of the Klamath Basin in Oregon. The United States has filed claims to protect its interests as part of this adjudication, including specific instream flow claims for the Klamath River from Link River Dam to the Oregon-California border (thus including portions of the Project area at issue in this FERC proceeding) on behalf of the Klamath Tribes and other federal interests. Once the State of Oregon issues a binding decree in the adjudication, all parties with water rights in the Klamath River Basin in Oregon will exercise those rights consistent with that decree.

FERC does not have a role in either process described above. Moreover, the Department's comments, recommendations, terms and conditions, and prescriptions do not ask FERC to take any action or otherwise engage in either of these processes. This FERC proceeding, however, will result in certain conditions being imposed on the licensee in the operation of the FERC-licensed hydroelectric project. The Department is including reservations of its FPA sections 4(e) and 18 authorities to accommodate any necessary license changes resulting from Reclamation's future operational requirements or the adjudication process that will ultimately determine various water rights within the Project area.

The Department looks forward to working with the Applicant and the Commission to ensure that the Project, if relicensed, can contribute to long-term basinwide solutions.

ENERGY POLICY ACT REVIEW PROCESS

The Energy Policy Act of 2005 (EP Act) provides parties to this licensing proceeding the opportunity to request trial-type hearings regarding issues of material fact that support the conditions and prescriptions developed under FPA sections 4(e) (Federal reservations) and 18 (fishway prescriptions). Through this filing, the Department is submitting preliminary mandatory conditions and prescriptions, along with the administrative records for these conditions and prescriptions. The Act also allows parties to propose alternatives to preliminary prescriptions and conditions. Procedures for requesting a trial-type hearing on a factual issue or for proposing alternatives are set forth at 43 C.F.R. Part 45 of the Department's regulations. The Department will file modified conditions and/or prescriptions with the Commission following the completion of any EPAct processes required within 60 days of the close of the comment period on the Commission's draft NEPA document.

TRIBAL TRUST

A unique relationship exists between the Federal government and Indian tribes. The Department acts to ensure the proper discharge of the Federal trust responsibilities to Indian tribes, a responsibility shared by all Federal agencies including the Commission. With respect to interests potentially affected by the FERC-licensed Project, five federally-recognized tribes (Tribes) reside in the Klamath Basin in the geographic area affected by Project operations: the Klamath Tribes of Oregon, the Hoopa Valley Tribe, the Yurok Tribe, the Karuk Tribe of California, and the Resighini Rancheria of California. These Tribes have recognized property interests in the basin, which the United States holds in trust or otherwise tries to enhance for their benefit and which varies with the individual tribe and its associated ethnological and legal history. Among other interests, the Klamath Tribes have treaty-protected fishing, hunting, trapping, and gathering rights, and the Hoopa Valley and Yurok Tribes have federally reserved fishing rights in the Klamath Basin recognized by various court decisions and other Department memoranda. The Tribes' fishing rights entitle them to harvest for subsistence, ceremonial, and commercial purposes.

Restoration of anadromous fish to the Klamath River in and above the Project will help meet not only various statutory requirements but also the Federal Trust Responsibilities to the Basin's Indian Tribes. Basin Tribes hold Federal Reserved fishing rights to take both resident and anadromous fish within their reservation in order to support ceremonial, subsistence, and commercial needs. See, e.g., United States v. Adair, 723 F.2d 1394, 1408-15 (9th Cir. 1984), cert. denied, 467 U.S. 1252; Parravano v. Babbitt, 70 F.3d 539 (9th Cir. 1984), cert. denied 518 U.S. 1016 (1996); Memorandum from John D. Leshy, Solicitor of the Department of the Interior to the Secretary of the Interior (October 4, 1993).

Restoration of anadromous runs in the currently unutilized habitat above the dams would help restore and enhance fish harvests throughout the Basin to the benefit of the Tribes. Restoration and enhancement of fish runs would also benefit commercial, recreational, and subsistence fisheries throughout the Klamath River and off the coasts of Oregon and California.

The Department has strived to meet its Tribal trust responsibilities in all our Project relicensing activities. This includes the responsibilities described in the Department's June 5, 1997, Secretarial Order Regarding American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the ESA (U. S. Department of the Interior 1997). That document defined Tribal trust resources as those natural resources, either on or off Indian lands, retained by, or reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary obligation on the part of the United States. In providing these conditions and recommendations, the Department acts in accordance with its trust responsibilities on behalf of Indian tribes and individuals when Indian trust and treaty resources are involved, as they are here. In particular, on the Klamath River, the Department is committed to improving the access of Tribes to anadromous and resident fish.

COMPREHENSIVE PLANS FOR THE BASIN

The Department reviews hydropower projects in accordance with the goals and objectives of applicable national and regional resource management plans. Restoration of anadromous and resident fish habitat in the Klamath Basin is included in the plans of many agencies and organizations.

Basinwide Plans

1. Klamath River Basin Fishery Resources Restoration Act

In 1986 Congress adopted the Klamath River Basin Fishery Resources Restoration Act (Public Law 99-552, codified as amended at 16 U.S.C. § 460ss *et seq*.) (Klamath Act). This law established a federal-state cooperative called the 'Klamath River Basin Conservation Area Restoration Program' for the rebuilding of the river's fish resources. The Klamath Act also established the Klamath River Basin Fisheries Task Force (Task Force), and directed the Task Force to assist the Secretary of the Interior in the creation and implementation of *"…a 20 year program to restore anadromous fish populations of the [Klamath River Basin] Area to optimum levels and maintain such levels."* The Klamath Act also created the Klamath Fishery Management Council, and directed the Council to make recommendations to federal, state and tribal agencies for the management of ocean and in-river harvesting that affects Klamath and Trinity anadromous fisheries.

2. Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program

A Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program (LRP) and Environmental Impact Statement (EIS) for the river below Iron Gate Dam were completed by the Task Force in 1991 (USDI Klamath River Basin Fisheries Task Force 1991). The LRP generally directs that fishery restoration is to be achieved through fish habitat protection and restoration, from a total watershed perspective, not simply an instream perspective. The LRP was accepted by FERC as a "comprehensive plan" under the Federal Power Act on January 15, 2004. The goals of the LRP are:

"Restore, by the year 2006, the biological productivity of the Klamath River Basin in order to provide viable commercial and recreational ocean fisheries and in-River tribal (subsistence, ceremonial and commercial) and recreational fisheries.

I. Ensure that the Klamath Fishery Management Council devises harvest regulation recommendations that will provide for viable commercial, recreational, and tribal fisheries.
II. Recommend to the Congress, state legislatures, and local governments the actions each must take to protect the fish and fish habitats of the Klamath River Basin.
III. Inform the public about the value of anadromous fish to the Klamath River region and gain their support for the Restoration Program.

IV. Promote cooperative relationships between the lawful users of the Basin's land and water resources and those who are primarily concerned with the implementation of the Restoration Plan and Program."

Specifically, the plan calls for protection of salmon and steelhead habitat from harmful effects of water and power projects in the Klamath Basin in Objective 2.E. Sub-Objectives that pertain to this relicensing include:

- 2.E.1.A Reevaluate the currently available spawning and rearing habitat located above Iron Gate Dam, where needed.
- 2.E.1.B Monitor water quality, including water temperatures, above, within, and below the Copco and Iron Gate reservoirs... to determine the effects of water storage and power plant operations on downstream habitat conditions.
- 2.E.1.C Evaluate the instream flow needs... of each salmon and steelhead run and life stage affected by flows released from Iron Gate Dam.
- 2.E.2 A-C Identify and implement methods to rectify habitat problems identified in #1 above, including the following:
    a. Access above Iron Gate and Copco Dams to the upper Klamath Basin;
    b. Water quality above and below Iron Gate Dam;
    c. Instream flow and habitat below Iron Gate Dam.
- 2.E.3 Promote adequate fish protection requirements in the relicensing conditions for the Iron Gate Hydroelectric Project and other power projects by the FERC.
- 2.E.4 Advocate inclusion and enforcement of effective conditions for salmonid habitat protection on small and large hydroelectric projects and other water storage projects.
- 2.E.7 Require water flows adequate to achieve optimal productivity of the basin.

In a letter dated March 21, 2001, the Task Force stated its goal that the relicensing of the Klamath Hydroelectric Project will "result in the successful restoration of anadromous salmonids to their historical range as well as improvements to habitat of the Klamath River below the Project" (USDI Klamath River Basin Fisheries Task Force 2001).

ESA Recovery Plans

1. Federally Listed Suckers

The Recovery Plan for Lost River and shortnose suckers (USFWS 1993) calls for the improvement of habitat conditions through rehabilitating riparian areas and improving land management practices in the Klamath River watershed, developing and achieving water quality and quantity goals, and improving fish passage, spawning habitat, and other habitat conditions.

2. Bull Trout

The draft Bull Trout Recovery Plan, Klamath River Recovery Unit Chapter (USDI Fish and Wildlife Service 2002) calls for upward trends in quality to be achieved through landscape-level adjustments in land management strategies designed to maintain and/or enhance structural and functional attributes of upslope, riparian, and fluvial systems. Portions of the upper Klamath drainage, including Agency Lake and Sun Creek; portions of Coyote Creek, Long Creek, and Sycan Marsh; and portions of Boulder Creek, Brownsworth Creek, Deming Creek, Dixon Creek,

Leonard Creek, Sheepy Creek, and the North Fork of the Sprague River have been designated as Critical Habitat for Bull Trout (USDI Fish and Wildlife Service 2004a). The designated critical habitat is all above Upper Klamath Lake, and does not intersect with the Project area.

3. Coho Salmon

NOAA Fisheries initiated development of a recovery plan for Southern Oregon Northern California Coast (SONCC) coho in 2001 by convening the SONCC Technical Recovery Team (TRT). The TRT is comprised of scientists from federal, state, tribal, academic, and local agencies/groups. During Phase I of recovery planning, the TRT is focusing on development of delisting goals for the SONCC coho, identifying factors for the decline and factors limiting recovery of the species, identifying early actions that can be taken by co-managers to reduce impacts to the species and habitat, and identifying, monitoring and evaluation needs for the species and habitat conditions. During Phase II of the recovery planning process, NOAA Fisheries and stakeholders will evaluate and build on existing coho conservation programs to develop a plan that will create a "blueprint" to achieve the SONCC coho recovery goals identified by the TRT.

Regional Plans

1. Northwest Forest Plan

The Northwest Forest Plan's Aquatic Conservation Strategy (ACS) provides a framework for restoration and recovery of wild anadromous fish stocks on federal lands in the Pacific Northwest. Central to the ACS is the restoration of habitat and ecosystem health by maintaining and restoring aquatic habitat, restoring habitat connectivity, and maintaining flows sufficient to sustain component elements of aquatic systems. Much of the Klamath River watershed is in BLM or Forest Service ownership. Land management by these agencies adheres to this Plan.

2. Bureau of Land Management Resource Management Plans

    a. Klamath Falls Resource Area, Medford District, and Redding Field Office

The Resource Management Plans for the Klamath Falls Resource Area, Medford District, and Redding Field Office were developed as part of the Northwest Forest Plan and respond to the need for healthy forest ecosystems and habitat to support native species, including protection of riparian areas and waters, as well as the need for a sustainable supply of timber and other forest products necessary to maintain local and regional economies. The Klamath River occurs in the Northwest Forest Plan area and is administered as a riparian reserve. Riparian reserves are designed to maintain and restore aquatic ecosystem functions and together with the Aquatic Conservation Strategy (ACS) of the Northwest Forest Plan provide substantial watershed protection.

Approximately 11 miles of the Upper Klamath River is located within the Klamath Falls Resource Area in Klamath County, Oregon. According to the Klamath Falls Resource Area RMP the riparian reserve for the Klamath River includes "the stream and the area on each side of the stream extending from the edges of the active stream channel to the outer edges of the 100 year floodplain or 320 feet on each side of the river, whichever is greater." As a general rule, management of riparian reserves prohibits or regulates activities that retard or prevent attainment of objectives of the ACS.

b. Cascade Siskiyou National Monument

The Cascade Siskiyou National Monument is located within the Medford District and was established on June 9, 2000. The Monument encompasses portions of the Scotch Creek, Camp Creek, Jenny Creek, and Fall Creek watersheds which flow into Iron Gate Reservoir. The Proposed BLM Resource Management Plan and Final EIS for the Monument includes the following Primary Management Objectives for Riparian Areas:

- Protect and enhance hydrologic function, aquatic connectivity, and water quality;
- Maintain and improve wetland and riparian plant communities and structure; and
- Protect and enhance riparian areas as habitat for terrestrial and aquatic organisms.

Streams with the highest priority for aquatic habitat restoration and protection are located in the Jenny Creek watershed (USDI Bureau of Land Management 2005).

National Plans

1. Fisheries USA

On February 4, 1993, the Commission accepted the Service's recreational fisheries policy entitled "Fisheries USA" as a comprehensive plan pursuant to section 10(a) of the FPA. The policy identifies the Service's commitment to protect the quality and quantity of the Nation's recreational fisheries and to optimize opportunities for people to enjoy these recreational fisheries (Service 1989). The Nation's recreational fisheries are socially and economically significant, and the demand for recreational fishing opportunities is projected to increase. Actions that can be taken to meet this increasing demand include ensuring full consideration of recreational fisheries in water resource projects, restoring or enhancing depleted or declining fisheries, and optimizing productivity of existing fisheries through habitat and water quality improvements.

2. Action Plan for Fisheries Resources and Aquatic Ecosystems

The Action Plan (USDI Fish and Wildlife Service 1994) presents a comprehensive ecosystem- and watershed-based conservation, restoration, and enhancement program focusing on nationally significant fishery resources through scientific management of aquatic communities and wild populations. Interjurisdictional waters and those with National Wildlife Refuges, such as the Klamath River watershed, are covered by the plan. Among the highest priorities to be addressed through the implementation of this Action Plan are the conservation of self-sustaining native fish

populations for the maintenance of productive fisheries in healthy aquatic habitats, developing partnerships, and assuring long term ecosystem health. Among the several components of the Action Plan is the restoration and protection of the quantity and quality of water available for fishery resources and aquatic ecosystem integrity. High priority actions intended to accomplish this component include the establishment, maintenance, and protection of instream flows in important fishery habitats and the recommendation of effective approaches for fish passage for hydroelectric and other water development projects.

3. Conserving America's Fisheries - The Fisheries Program Vision for the Future

This National Strategic Plan (Plan) was developed by the Service in December 2002, in collaboration with the Sport Fishing and Boating Partnership Council, which represents a wide range of fishing and aquatic conservation organizations across the country. The Plan presents a comprehensive ecosystem- and watershed-based conservation, restoration, and enhancement program for fisheries management focusing on the management of aquatic communities, recreationally important fisheries, and native fish populations. The Plan has been "stepped down" to the Pacific Region of the U.S. Fish and Wildlife Service in the form of a "Pacific Region: Fisheries Program Strategic Plan." Both the national and regional strategic plans are implemented through cooperative partnerships with State, regional, local, and Tribal governments, non-governmental organizations, watershed councils, and a variety of businesses and private interests. The Regional Strategic Plan priorities include conserving self-sustaining native fish populations for the maintenance of productive fisheries in healthy aquatic habitats, and maintaining healthy native fish populations through genetic diversity, harvest management, habitat improvements, and judicious use of hatchery stocks. High priority actions intended to restore and protect the quantity and quality of water available for fishery resources and aquatic ecosystem integrity include the establishment, maintenance, and protection of instream flows in important fishery habitats, and the recommendation of effective approaches for fish passage for hydroelectric and other water development projects.

HISTORY AND DESCRIPTION OF THE KLAMATH HYDROELECTRIC PROJECT

1. Location

The Klamath River watershed is located in northern California and southwestern Oregon. It covers approximately 12,000 square miles and extends more than 350 river miles from its headwaters to the Pacific Ocean (National Research Council 2003). More than half the watershed is mountainous, with extensive lowlands found only in southern Oregon in the upper part of the Basin. In California, lowlands occur irregularly, primarily in major tributary streams (U. S. Department of the Interior 1985). The Wood, Williamson, Sprague, and Sycan Rivers are the significant headwater tributaries that flow into Upper Klamath Lake. Water flows from Upper Klamath Lake into Link River, a short river (about 1.2 miles long), and then into Lake Ewauna near Klamath Falls, Oregon. The Klamath River officially begins at the downstream end of Lake Ewauna. Iron Gate Dam, at 190 river miles from the Pacific Ocean, is a commonly recognized dividing point between what is referred to as the upper and lower river basins.

Significant tributaries do not enter the lower Klamath River until the Shasta River joins the Klamath River in California, downstream from Iron Gate Dam. The Scott, Salmon, and Trinity Rivers and a number of creeks enter the Klamath River as it flows through California. The Klamath River enters the Pacific Ocean about 15 miles south of Crescent City, California.

Today, the watershed includes about 96,000 acres of tribal trust lands, four million acres of private lands, and six million acres of public lands. The Klamath basin includes six National Wildlife Refuges (Bear Valley, Clear Lake, Klamath Marsh, Lower Klamath, Tule Lake, and Upper Klamath), a National Park (Crater Lake), five National Forests (Fremont-Winema, Klamath, Shasta-Trinity, Modoc, and Six Rivers), two National Monuments (Lava Beds and Cascade Siskiyou), three Wild and Scenic River designations (Klamath River from J.C. Boyle Powerhouse to the California-Oregon border, North Fork Sprague River, and the Sycan River), and other public lands.

2. Klamath Reclamation Project

The Klamath Reclamation Project (Reclamation Project, or Irrigation Project) is located in the Upper Klamath River and the Lost River Basins in southern Oregon and northern California. The Reclamation Project provides irrigation water to agricultural lands within the Project and delivers water to two National Wildlife Refuges that are wholly located within the Project (Lower Klamath and Tule Lake National Wildlife Refuges). The Klamath Reclamation Project was authorized pursuant to the Reclamation Act of 1902 and construction began in 1905. As part of the Reclamation Project development, certain lakes were drained and opened for homesteads, diversion structures, canals and drains were constructed, and project storage was provided. In 1908, the first National Wildlife Refuge was established in the area and was overlaid on the Reclamation Project. Other refuges were established within and adjacent to the Reclamation Project in 1911 (Clear Lake) and in 1928 (Tule Lake and Upper Klamath Lake).

Link River Dam, operated by the Applicant under contract with Reclamation, regulates flow from Upper Klamath Lake (UKL) into Link River and thus into the Klamath River. Water diverted from UKL provides the majority of the irrigation supplies for the Klamath Irrigation Project lands. Mean net inflow into the lake is 1.2 million acre-feet per year. The lake has a total storage capacity of about 612,000 acre-feet but a maximum operational capacity of about 486,000 acre-feet from elevations 4143.3 feet to 4137.1 feet (USDI Bureau of Reclamation 2000). Reclamation currently operates the irrigation project pursuant to two Biological Opinions issued under the Endangered Species Act (ESA). The Biological Opinions require Reclamation to release water in a way that maintains minimum levels in Upper Klamath Lake and specified flows in the Klamath River below Iron Gate Dam. Reclamation issues annual operations plans based on a forecast of available supply, generally as of April 1st of each year. The plan includes a description of the Biological Opinion Requirements for Upper Klamath Lake and the Klamath River and estimated supplies of water for agriculture and refuges within the Reclamation Project. These values are modified as necessary based on the actual hydrology for that year.

3. Klamath Hydroelectric Project

The Klamath Hydroelectric Project is located on the Klamath River in Klamath County, Oregon; and Siskiyou County, California (Figure 1). The Project consists of five mainstem dams (four of which supply powerhouses), two powerhouses at the federal Link River Dam, and one tributary facility. The dams are small to medium size, ranging in height from 25 to 173 feet in height, and impound small to medium sized, narrow reservoirs. The segment of the Klamath River between Link River Dam and Iron Gate Dam consists of about 24 miles of river reaches and about 36 miles of reservoirs, as follows:

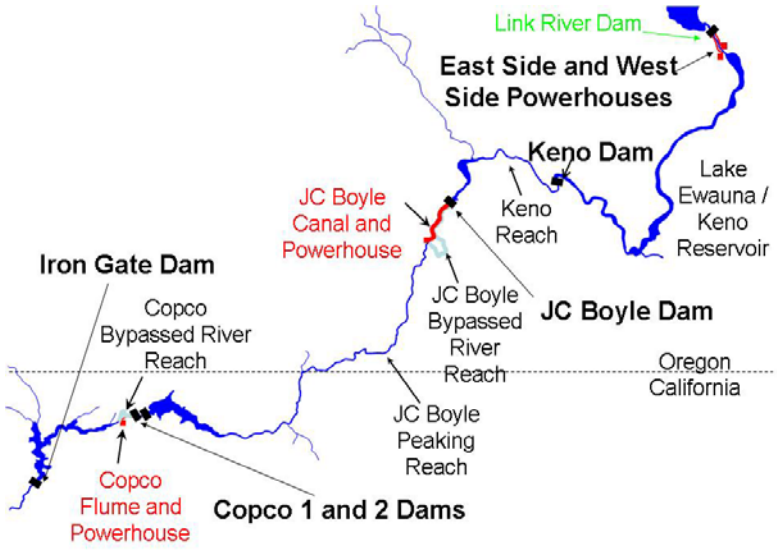


Figure 1. Project Location

- At Reclamation's Link River Dam, at the lower end of Upper Klamath Lake, the Eastside and Westside Powerhouses receive water diverted into canals on each side of the river. The Link River flows into Lake Ewauna, which is the upper end of an impounded reach of the Klamath River that is also known as Keno Reservoir, controlled by Keno Dam.
- Keno Dam is at River Mile (RM) 233, approximately 20 miles downstream from Link River Dam. Below Keno Dam, the 4.7-mile long Keno Reach flows into J.C. Boyle Reservoir (also known as Topsy Reservoir), created by J.C. Boyle Dam.
- J.C. Boyle Dam is at RM 224.7. Here most of the flow is diverted out of the river through a canal around the four-mile J.C. Boyle Bypassed River Reach. The canal extends to the J.C. Boyle Powerhouse at RM 220.4. Below the powerhouse, the 17-mile J.C. Boyle Peaking Reach of the Klamath River receives a daily peaking regime.
- Near RM 209, the river crosses into California, and enters Copco Reservoir near RM 204. Copco Reservoir is impounded by Copco 1 Dam at RM 198.7, where flow is diverted into the adjacent Copco 1 Powerhouse. About one-half mile below this powerhouse, Copco 2 Dam diverts almost the entire flow from Copco 2 Reservoir into a penstock around the 1.4-mile Copco Bypassed River Reach to Copco 2 Powerhouse at RM 196.8.
- Below Copco 2 Powerhouse, the river flows into Iron Gate Reservoir, impounded by Iron Gate Dam at RM 190. This is the furthest downstream of the Project facilities. Here the flow passes through the Iron Gate Powerhouse, and then the Klamath River continues for 190 miles to the Pacific Ocean.
- The Fall Creek development is the smallest in terms of generation, the oldest, and the only development not on the mainstem Klamath River. Flow from Spring Creek (in the Jenny Creek watershed) is diverted into Fall Creek in Oregon, and these waters flow

through the Fall Creek Powerhouse about one mile above Fall Creek's juncture with the upper end of Iron Gate Reservoir.

4. Proposed Klamath Hydroelectric Project Boundary

The proposed Project boundary included in the FLA would reduce the Project footprint and decrease the amount of United States-owned land within the Project boundary. The proposed boundary would affect resources administered by BLM and Reclamation. For BLM the reduction would be from approximately 219 acres in the current license to 156 acres in the proposed license. The types of facilities that would be removed from the Project include a mainstem dam, roads, trails, campgrounds, boat launch and take out sites, dispersed camping sites and day-use areas. The Department has many concerns about the proposed boundary changes including the exclusion of:

a) Keno Dam;
b) Project roads and facilities operations and maintenance;
c) the JC Boyle Bypassed River Reach and the J.C. Boyle emergency spillway; and
d) Topsy campground.

a) Keno Dam

PacifiCorp has proposed to exclude Keno Dam from the boundary of the Project. The Department opposes this proposed exclusion, as PacifiCorp's Keno development is part of a complete unit of hydroelectric development that benefits from the release of water from Reclamation's Link River Dam and return flow from the Reclamation Project, and it is integral to flows necessary for power generation below Keno Dam. Keno regulates water for power production at JC Boyle Powerplant, and moderates the impacts of peaking at the East Side Powerplant, as seen in the graphs from 2005 water deliveries and power production below (Fig. 2, 3, and 4). The changes in flows at Keno Dam depicted here are strictly for power production, not to meet the needs of Reclamation downstream. Therefore, the Commission should continue to include Keno Dam in the Project boundary.

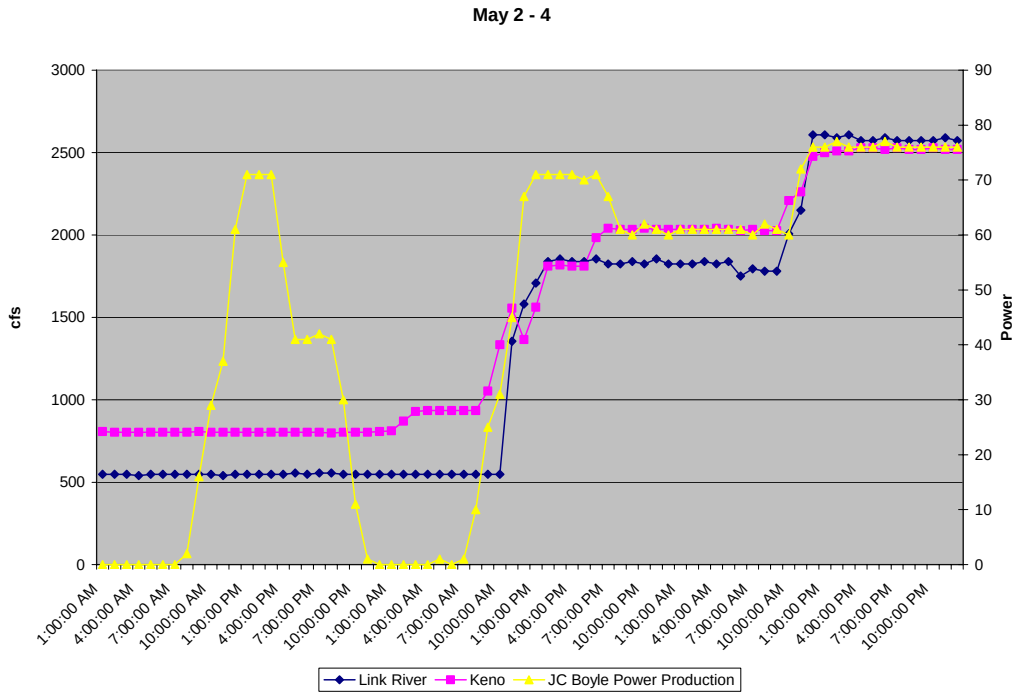


Figure 2: Keno Operations to Benefit Hydropower, May 2-4, 2005

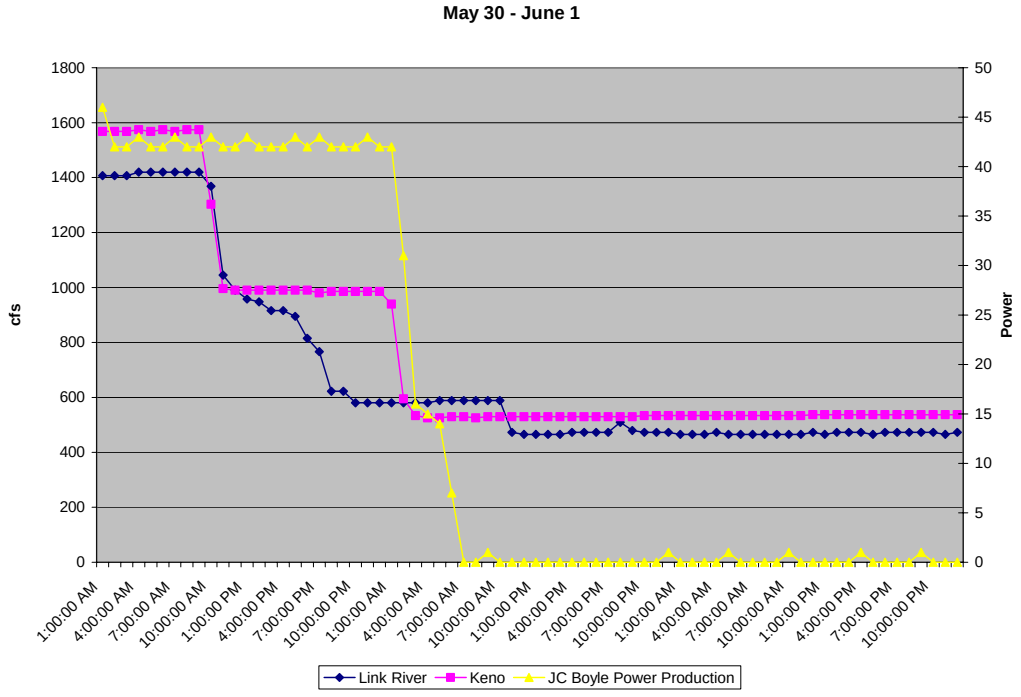


Figure 3: Keno Operations to Benefit Hydropower, May 30-June 1, 2005

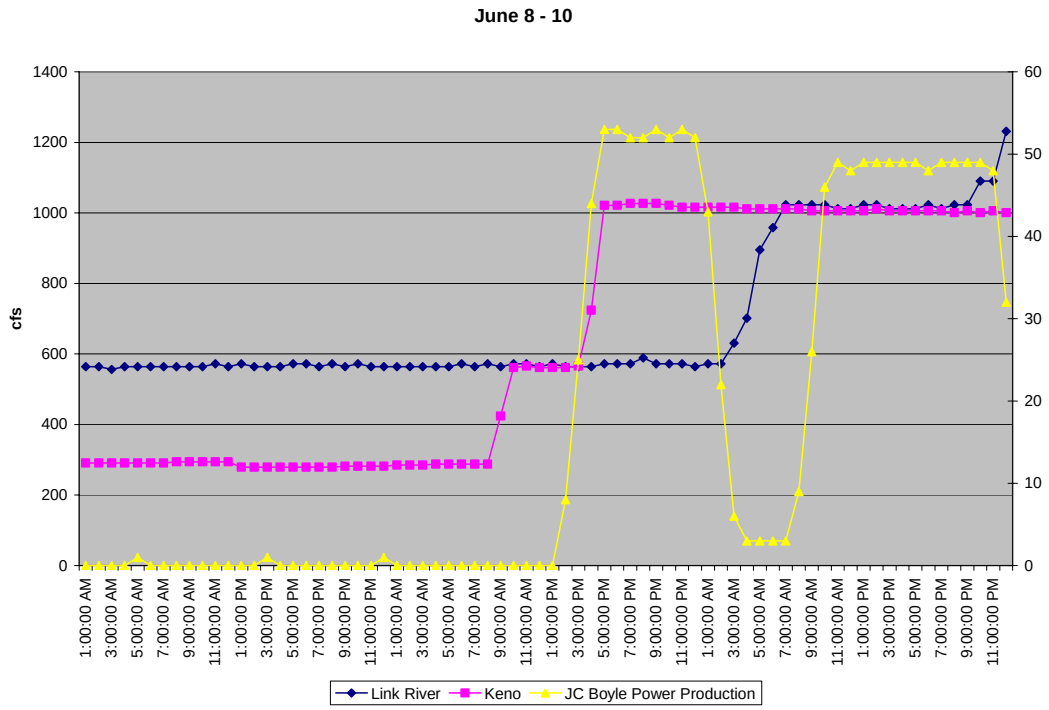


Figure 4: Keno Operations to Benefit Hydropower, June 8-9, 2005

Should the Commission decide not to allow decommissioning of the East Side and West Side Powerhouses, there would be still more evidence that Keno Dam services Project purposes. A representative of PacifiCorp testified in the Oregon PUC hearing that there were times when PacifiCorp used its flexibility to manage Link River Dam.[1] Large daily fluctuations can be directly attributed to the operation of the East Side Powerplant downstream of Link River Dam for peaking operations. A representative peaking operation is evident in gage data from August 3-5, 2005.

The Federal Power Commission found the original Keno Dam to be jurisdictional in 1960. The existing Keno Dam was licensed to be constructed with no generating facilities in 1965. The existing Keno Dam was constructed partially on federal lands subject to the Commission's express provision that the licensee enter into a formal agreement with Reclamation for the purpose of regulating the level of Lake Ewauna between Keno Dam and Link River.[2]

[1] Transcript of Oregon Public Utilities Commission hearing for Rate Case UE 170, dated February 16, 2006

[2] Contract between the United States of America and Pacific Power & Light Company, Contract No. 14-06-200-3579A, dated January 4, 1968.

The Department's position that Keno Dam should remain a part of any new license issued for the Project and that the use of Link River Dam is critical to the Project is supported by the FPA.[3] Section 3(11) of the FPA defines "project" to include ditches, dams, reservoirs, lands or interest in lands the use and occupancy of which are necessary or appropriate in the maintenance and operation of the proposed power development. PacifiCorp admits in the FLA that the operation of Keno Dam serves Project purposes: "In operating Keno Dam, PacifiCorp can more effectively schedule and plan load following operations at the J.C. Boyle powerhouse." (FLA, Exhibit B, Page 8-2). Moreover, PacifiCorp recognizes that Keno operates as a re-regulation facility (Comments of PacifiCorp Regarding Proposed Readjustment of Annual Charges, Feb 21, 2006 at 4, 13.)

Keno Dam is used by the Applicant as an upstream regulating reservoir to provide inflow to its downstream power production facilities. Reclamation currently has an agreement with PacifiCorp that PacifiCorp operate Keno Dam to hold Lake Ewauna / Keno Reservoir within a variance of only 0.5 foot. Because of its large surface area, approximately 5,900 acre feet of water storage are provided by the 0.5 foot variance in reservoir elevation, which equates to approximately 30 days of a flow of 100 cfs. The practice of using reservoir storage to follow short-term peaks in power demand – known as load following – results in rapid and significant changes in river flow and reservoir elevation. The larger storage behind Keno Dam (which is more than at J.C. Boyle Reservoir), with a 0.5 foot daily reservoir fluctuation, has given PacifiCorp more options to maximize peaking at the downstream J.C. Boyle and Copco peaking facilities. PacifiCorp's Keno Reservoir storage is being utilized to provide flow fluctuations in support of hydroelectric peaking operations at J.C. Boyle Dam, downstream.

PacifiCorp states that flows below Keno Dam, in the Keno Reach, are dependent entirely on what is delivered to the Link River to Keno reach by Reclamation and other irrigation operations and that PacifiCorp has no discretion or control over flows in the Keno Reach. However, there is great discretion on when those accumulated flows are delivered to the reach below Keno Dam, as can be seen in the previous graphs. This claimed lack of control is also contradicted by the fact that 80 percent of the inflow to Lake Ewauna is from Link River while approximately 20 percent is from agricultural returns with a very small amount from municipal and industrial inputs (PacifiCorp 2004, FLA WTR). PacifiCorp can and does alter flows in the Link River and Keno Reach for hydroelectric Project purposes, including maintenance actions, and to maximize peaking at downstream Project peaking facilities.

[3] As to Keno Dam, PacifiCorp is still under contract to Reclamation as part of Project No. 2082 to operate Keno Dam. See Article 55 of PacifiCorp's FERC license issued in Order dated 11/29/1965, 34 F.P.C. 1387 (requiring "formal agreement" or the Commission will prescribe terms for regulation of Lake Ewauna). The 1968 contract between PacifiCorp and Reclamation for Keno Dam references the FPC order, Article 55. See also Order dated 6/20/1969, 41 F.P.C. 824. Even if PacifiCorp "excludes" Keno Dam from its Project, PacifiCorp is still required to operate Keno Dam under its contract with Reclamation. Thus, PacifiCorp is contractually required to operate and maintain Keno Dam as long as PacifiCorp operates the Project. Thus, Keno Dam must remain a part of the Project.

The relationship of Link River and Keno Dams to the Project confirms that Keno Dam is necessary to the operation of the Project. The Link River Dam is a Reclamation facility currently operated by PacifiCorp under contract with Reclamation. Water released from Upper Klamath Lake via Link River Dam, continues downstream through the power project. This water is essential for the operation of the Project. In addition to the water released from Link River Dam that is delivered through the power project, Keno Dam captures and re-regulates additional surplus water from the Klamath Reclamation Project that is delivered to the river through pumping at three large federal pumping plants. This pumped surplus water is accrued through recirculation of drainage water that is pumped into the system by private and water district pumps, in addition to the federal pumping. In the period 1997 through 2004, a period significantly drier than the period 1956 through 1996 (an average of 291,180 acre-feet less annual inflow into Upper Klamath Lake), deliveries of that available water actually increased by 5.5% of the average annual inflow, providing relatively more water for generation by PacifiCorp that was provided in the previous period, as shown in the Table 1.

Table 1. Klamath River Flow Measured at Keno Oregon (All quantities are in thousands of acre-feet)

Wtr Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	UKL Inflow	% of UKL Inflow Past Keno
Avg 56-96	90.8	113.4	143.2	145.4	138.9	191.2	148.2	100.1	46.7	32.0	46.3	65.3	1261.6	1421.2	88.8%
Avg 97-04	61.8	67.7	90.5	149.8	141.8	163.7	139.1	117.9	71.3	38.6	39.2	44.4	1065.8	1130.0	94.3%
Avg Diff	29.0	45.6	52.7	-4.5	-2.9	27.5	9.2	-17.8	-24.6	-6.6	7.1	20.9	195.8	291.2	

If FERC concludes that Keno is not part of the Project, it must commence a decommissioning proceeding, subject to FERC regulations and its Decommissioning Policy.[4] The manner in which the Keno dam is to be operated must be described, and the effects of those operations must be analyzed, including the contractual obligations PacifiCorp has to Reclamation to operate Keno Dam.

[4] 69 FERC ¶ 61,336 (1994): "In those instances where it has been determined that a project will no longer be licensed, because the licensee either decides not to seek a new license, rejects the license issued, or is denied a new license, the project must be decommissioned."… "The Commission is of the opinion that implicit in the section 6 surrender provision is the view that a licensee ought not to be able simply to walk away from a Commission-licensed project without any Commission consideration of the various public interests that might be implicated by that step. Rather, the Commission should be able to take appropriate steps that will satisfactorily protect the public interests involved."…"Absent specific authority by the Federal agency involved for continued use of Federal lands at the termination of Commission licensing, it is eminently reasonable that the licensee must restore the lands to that agency's satisfaction, at the licensee's expense." See 18 CFR Sec 6.2 (on surrender a licensee is required to restore lands of the United States to a condition satisfactory to the Department administering those lands).

b) Roads and Facilities

Impacts to BLM-administered resources from construction and operation of facilities include erosion, impacts to hydrologic function, the spread of noxious weeds, fragmentation of wildlife habitat, and increased mortality of wildlife. Per 18CFR § 4.41(h)(2):

"The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of the environmental resources."

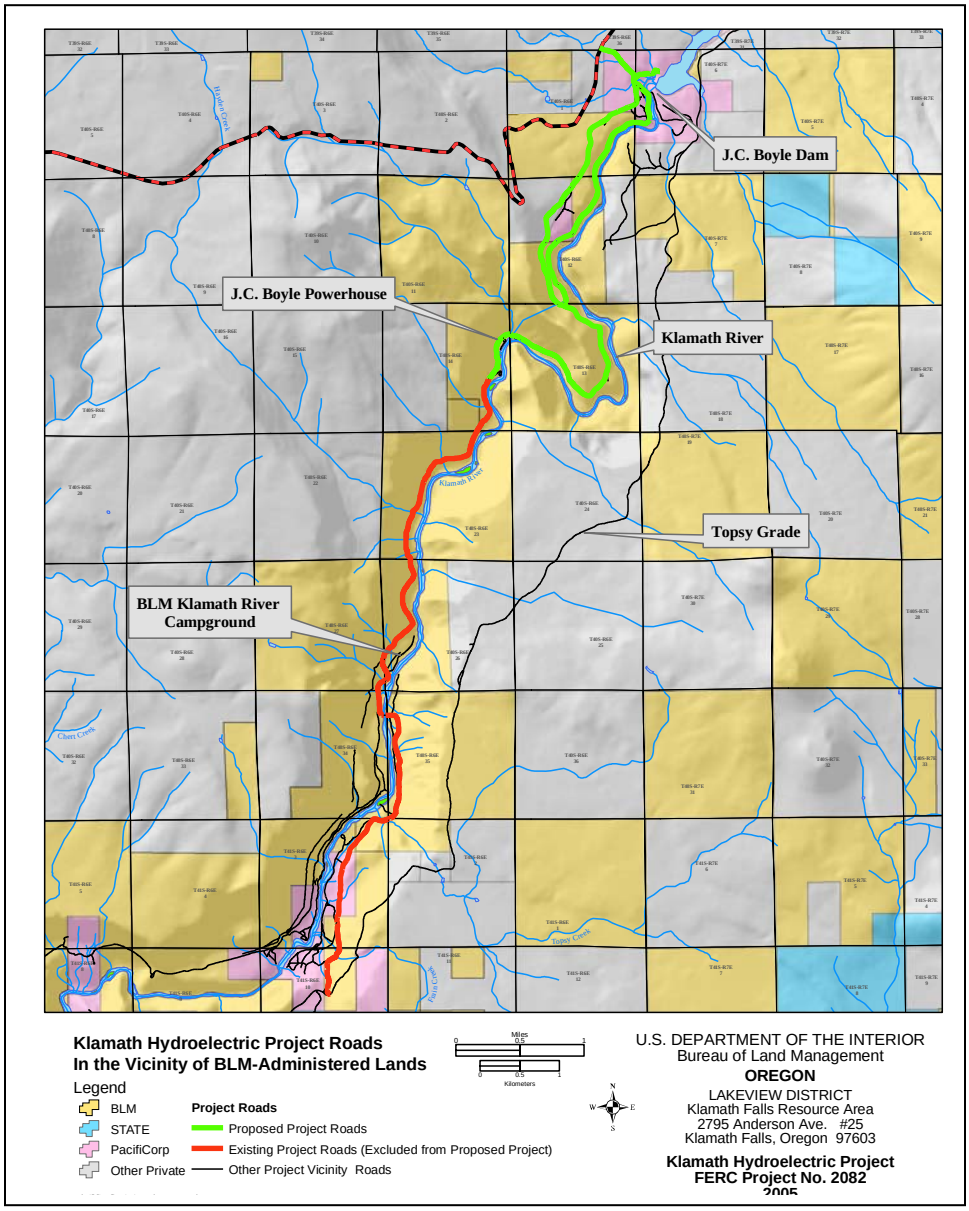
The proposed boundary adjustment excludes roads that were constructed and are currently utilized by PacifiCorp for Project operation and maintenance. Some of these roads have subsequently been used to access recreation facilities maintained by BLM for recreation uses that were enhanced as a function of the Project. Per 18 CFR § 4.41 (h) (2) (ii):

"The boundary around linear (*continuous*) project features such as access roads, transmission lines, and conduits may be described by specified distances from center lines or offset lines of survey. The width of such corridors must not exceed 200 feet unless good cause is shown for a greater width."

The proposed Project boundary excludes 5.6 miles of the Powerhouse Road (Figure 5, Klamath Hydroelectric Project Roads Map). The southern portion of the Powerhouse road between the Spring Island boat launch and the junction with Topsy Grade should be included in the new license for the following reasons:

- This Powerhouse road is adjacent to the Klamath River. The entire length of this road was withdrawn in 1959 for FERC Power Project #2082, Klamath Hydroelectric Project.
- This road continues to provide needed access for the operation and maintenance of PacifiCorp's transmission lines covered by 1970 and 1980 Rights-of-Ways.
- Regular maintenance of this road is required to prevent resource degradation and provide access to recreation sites associated with the Project.

Figure 5. Klamath Hydroelectric Project Roads



c) J.C. Boyle Bypassed River Reach

The J.C. Boyle Bypassed River Reach of the Klamath River (Bypassed Reach) is necessary for the operation of the Project. Per 18CFR § 4.41(h)(2):

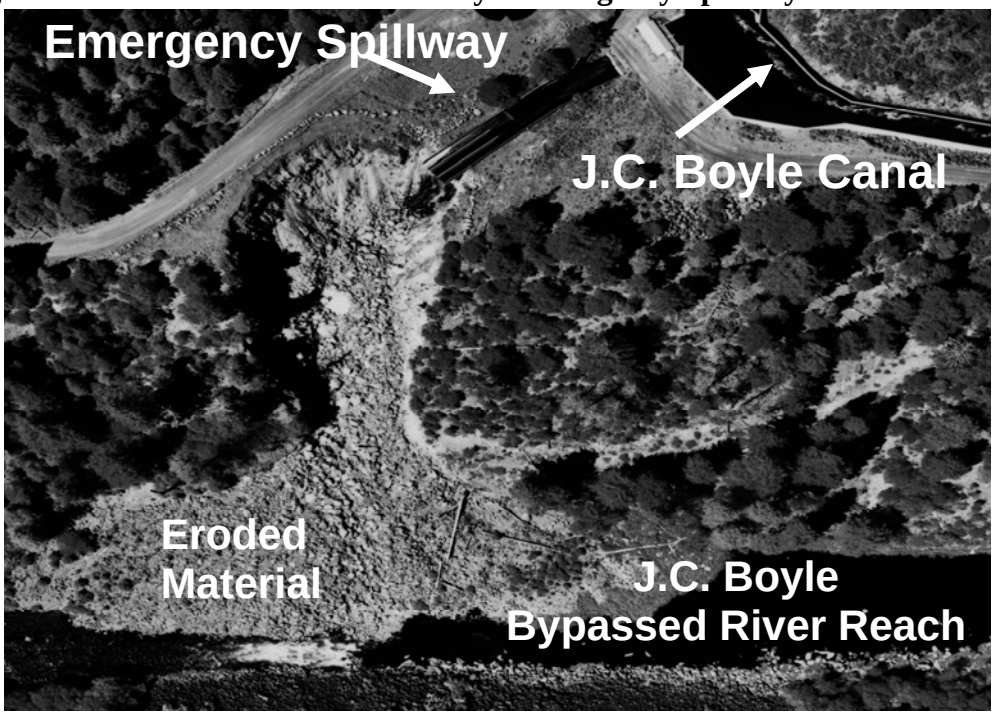
"The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of the environmental resources."

The J.C. Boyle Bypass Canal (Canal) has direct impacts on the Bypassed River Reach through at least two mechanisms: the J.C. Boyle Canal Emergency Spillway (Emergency Spillway) and breach of the Canal. These impacts make it necessary for PacifiCorp to manage the Bypassed River Reach for bank and floodplain stability and to reduce channel constriction. Both the Canal and Emergency Spillway have eroded hillslope material into the Bypassed Reach during the course of the current license.

Emergency Spillway: The proposed boundary excludes the area below the Emergency Spillway located near the downstream end of the Canal. Project operations have caused overflow from the spillway to surge onto steep, unprotected slopes and created hillslope erosion which has entered the J.C. Boyle Bypassed River Reach. The attached aerial photograph shows the extent of hillslope erosion as of August 6, 2001 (Figure 6). BLM estimates that over 80,000 cubic yards of material has been eroded from the hillside and a substantial portion of that material has entered the Bypassed River Reach. This equates to an average of nearly 2,000 cubic yards per year. Although modifications have been proposed to prevent recurring overflow of the J.C. Boyle Canal, the existing resource degradation is a direct result of PacifiCorp's operation of the facility.

The deposition of the eroded hillslope material below and downstream of the Emergency Spillway has diverted the direction of the water flow toward the opposite bank causing bank erosion. The hillslope erosion has also added large amounts of sediment that have been deposited in the middle of the channel. Consequently, use of the Emergency Spillway during the course of Project operations has had direct effects on aquatic and riparian habitat.

Figure 6. Erosion from use of J. C. Boyle Emergency Spillway



J.C. Boyle Bypass Canal Failure: In December of 2005,a rockslide damaged the J. C. Boyle Bypass Canal (Canal). The rockslide originated above the Canal and was likely the result of heavy precipitation and freeze-and-thaw conditions. Debris and a large rock traveled downslope creating a hole in the Canal. Water flowed from the hole and eroded the lower Canal road fill and adjacent hillslope depositing the material on the floodplain and in the Bypassed River Reach. Consequently, the Canal had direct impacts on the J.C. Boyle Bypassed River Reach when this breach in the Canal caused water to surge onto steep, unprotected slopes and created hillslope erosion contributing substantial amounts of sediment (approximately 75,000 to 100,000 cubic yards) to the Bypassed Reach (Figure 7).

In response to this event, PacifiCorp proposed and implemented emergency repair and mitigation in consideration of the BLM resources. The BLM and PacifiCorp evaluation of this site determined that the rock slide, subsequent canal leakage and hillslope erosion required remedial action to mitigate and prevent further damage to BLM administered resources. Mitigation included excavation of eroded material on the alluvial fan, surface stabilization measures (seeding, mulching) and removal of eroded material on floodplain. PacifiCorp plans to begin follow-up actions at the site in the spring of 2006 (PacifiCorp letter to BLM Field Manager, Klamath Falls Resource Area, dated February 28, 2006).

The potential for Canal failure due to a breach caused by a rockslide will continue to be present due to the steepness of the hillslope and natural climate driven processes such as heavy precipitation and freeze-and-thaw of the hillslope materials.

Figure 7: Erosion from December 2005 J.C. Boyle Canal Breach

The J.C. Boyle Bypassed River Reach should be included as part of the Project boundary. The Bypassed Reach will continue to be necessary for operation and maintenance of the Project under the new license. The J.C. Boyle power canal and the Emergency Spillway are both located upslope from the Bypassed River Reach. Project related operations occur in the Bypassed River Reach whenever there is a canal failure, when the emergency spillway is used or when spill occurs. The Bypassed River Reach lies between two of PacifiCorp's facilities and is affected by the diversion of water essential for Project operations. The Project, as proposed in the FLA, includes enhancement flows and ramping rates for the reach to mitigate impacts on fisheries. In addition, under the BLM's preliminary conditions, the Licensee will perform a number or ongoing activities in the Bypassed River Reach, including gravel augmentation and evaluation and monitoring activities. Therefore, the J.C. Boyle Bypassed River Reach should be included in the Project boundary since it is used during Project operations of the J.C. Boyle Canal and the Emergency Spillway; and is necessary for the protection of the environmental resources.

d. Topsy Campground

The Topsy Campground is located on J.C. Boyle Reservoir within Powersite Withdrawal #258 authorized by Executive Order #6910, and is included in the license for Project No. 2082 (Commission letter to BLM State Director, Oregon, dated March 1, 1963). The proposed boundary change would exclude the Topsy Campground. The Topsy Campground is the only developed and staffed camping facility on the J.C. Boyle Reservoir. Demand for camping at Topsy Campground is high on most weekends during summer months; however, the number of campsites (16), group sites, and improved day-use sites are limited.

The Topsy Campground was established due to the creation of the J.C. Boyle Reservoir, and should be included in the Project boundary as part of Project-related public recreation. Per 18 CFR § 4.41 (h) (2) (iii) (B):

"The boundary must enclose only those lands that are necessary for safe and efficient operation and maintenance of the project or for other specified project purposes, such as public recreation or protection of environmental resources."

RESOURCES AFFECTED BY THE PROJECT

This section summarizes information on the presence and status of several high priority fish and wildlife species within and near the Project area. More detail on these and other species is found in the discussion of impacts within the section 18 prescriptions and the section 10 recommendations.

AQUATIC RESOURCES

A. Threatened and Endangered Species

1. Lost River and Shortnose Suckers

The Lost River sucker and shortnose sucker are large, long-lived suckers endemic to the upper Klamath Basin of Oregon and California upstream of Keno. Both species are typically lake-dwelling for most of the year, but migrate to tributaries or shoreline springs to spawn during spring months (Scoppettone and Vinyard 1991). Once extremely abundant and important for subsistence by the Klamath Tribes, both species have experienced severe population declines in the upper basin and were federally listed as endangered in 1988 (USDI Fish and Wildlife Service 1988). Historically, Lost River and shortnose suckers passing downstream past the current site of Keno Dam were probably lost to the population, because suitable habitat did not exist downstream and they are not capable of swimming upstream in high gradient currents.

The creation of reservoirs at the four lower Klamath River hydroelectric facilities (J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate) provided a minor expansion of the range of these two sucker species (Buettner and Scoppettone 1991; Moyle 2002). Apparently suckers pass downstream from UKL through Link River and Keno Reservoir, and those that survive passage through the hydro dams may be retained in the Project reservoirs (National Research Council 2003). The reservoirs do not provide habitat for sucker spawning, and spawning has not been documented in the flowing reaches immediately upstream of Keno, J.C. Boyle, and Iron Gate reservoirs (Desjardins and Markle 2000; USDI Fish and Wildlife Service 2001a). Some shortnose sucker spawning occurs in the Klamath River above Copco Reservoir, but larval and juvenile survival appears low (Beak Consultants Inc. 1988). Several age classes exist in J.C. Boyle Reservoir, but it is believed that all of these fish arrived from upstream.

Upstream sucker passage is blocked at Iron Gate, Copco 1, and Copco 2 dams. Upstream passage facilities at J.C. Boyle and Keno dams are ineffective or do not comply with criteria for sucker passage (USDI Fish and Wildlife Service 2005). Reclamation completed a new fish ladder on Link River Dam in December 2004 designed for sucker passage.

Sucker populations in the Project reservoirs generally do not have a high potential for contribution to recovery because they are not part of the original habitat complex of the suckers, and the reservoirs probably are unsuitable for completion of life cycles by the suckers (National Research Council 2003). However, maintenance of adults in these locations does provide some insurance against loss of other subpopulations. As such, Service conditions and recommendations are generally limited to minimization of take in the facilities in the upper portion of the Project, and the provision of capacity to capture suckers below Keno Dam for possible use in recovery actions elsewhere.

2. Bull Trout

Bull trout once ranged widely in the Upper Klamath Basin, with stream-resident fish and juveniles in the headwaters, and large fluvial fish in the rivers and adfluvial fish in Upper Klamath Lake (Light et al. 1996). Klamath River bull trout were listed under the ESA as a distinct population segment in 1998 (USDI Fish and Wildlife Service 1998) because they are physically isolated from other bull trout by the Pacific Ocean and several small mountain ranges in central Oregon. Currently, bull trout are found in three core areas and nine currently identified local populations in the small headwater streams above Upper Klamath Lake well above the Project area. Water temperatures above 15^{o}C are believed to limit their distribution (Rieman and McIntyre 1995). Because of this limitation, bull trout are unlikely to occur in the Klamath River below Upper Klamath Lake and are not directly affected by the Project. However, return of anadromous fish to streams occupied by bull trout would provide greatly increased forage resources for this species.

3. Coho Salmon

The historic distribution of coho salmon in North America included coastal streams from Alaska to central California (Moyle 2002; Weitkamp et al. 1995). Historically, coho occurred in the Klamath River as far up as Spencer Creek, but there is no evidence of occurrence above Keno (Hamilton et al. 2005) Presently, coho are known to spawn in several tributaries below Iron Gate Dam, including Bogus Creek and the Shasta and Scott Rivers. Limited information exists regarding coho numbers, because counts are typically only made incidentally to determining fall Chinook salmon escapement. Also, most counting weirs are removed prior to high winter flows and therefore counting efforts may not include a portion of the coho salmon migration.

The SONCC coho salmon Evolutionarily Significant Unit (ESU) was originally listed as threatened under the ESA on May 6, 1997 (National Marine Fisheries Service 1997). In June, 2005, the species was again listed following a review. Coho salmon in California were officially added to the State's threatened and endangered species list effective March 30, 2005.

In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple 3-year life cycle. Coho begin the freshwater migration from the ocean to their natal streams after heavy late-fall or winter rains breach the sand bars at the mouths of coastal streams ((Sandercock 1991) in (Groot and Margolis 1991)). Migration continues to March, generally peaking in December and January, with spawning occurring shortly after returning to the spawning ground (Shapovalov and Taft 1954). Water temperatures for good survival and growth of juvenile coho salmon range from 10-15^{o}C (Bell 1986). (Shapovalov and Taft 1954). Coho require clear, well-oxygenated water and low temperatures. Preferred temperatures are 12-14^{o}C, although juveniles can under some conditions live at 18-29^{o}C for short periods (McCullough 1999 and Boyle 2002 in (National Research Council 2003)).

If suitable habitat is available, coho juveniles spend their first summer in natal streams. Outmigration of yearlings occurs in the second spring, but first-year coho fry are observed along with coho yearlings in the mainstem Klamath River during trapping of outmigrant Chinook salmon during spring and summer months (Shaw et al. 1997).

B. Resident Species

1. Redband Trout

Redband trout are a unique resident rainbow trout whose ancestors entered the upper Klamath Basin when it was connected to the Columbia Basin via the Snake River (Behnke 1992). Coastal rainbow trout (steelhead) later entered the Upper Basin, but the redband trout derived from the Columbia Basin maintained its identity and is recognizable by its morphology and color. Redband trout can survive at higher temperatures than most other western trout. Native stocks of redband trout in the Klamath watershed have also evolved resistance to an endemic protozoa disease, *Ceratomyxa shasta*, which is highly lethal to nonnative trout (Oregon Department of Fish and Wildlife 1997). The Oregon Basin redband trout, which includes the Klamath Basin populations, is listed as a state sensitive species (Oregon Department of Fish and Wildlife 1997).

Redband trout that rear in Upper Klamath Lake and the Klamath River migrate to tributaries to spawn in good quality flowing water, with appropriate depth and velocity, over a gravel substrate in which fish dig redds and deposit their eggs. The primary spawning streams within the Project are Spencer Creek and Shovel Creek.

Adult redband trout in Upper Klamath Lake and the Klamath River can reach 18-28 inches in fork length, and are a prized game species. Restrictive fishing regulations are in place in both Oregon and California. The whole river is restricted to the use of barbless flies and lures only.

Prior to construction of J.C. Boyle Dam in the late 1950s, the Klamath River wild trout population was noted for its abundance and large fish. Trout migrated freely through all reaches and many spawned in Spencer Creek, a principal tributary to the Klamath River. Redband also migrated upstream to the Williamson-Sprague River systems above Upper Klamath Lake (Fortune et al. 1966). A fish ladder constructed at J.C. Boyle Dam was intended to provide for this passage. However, from 1961 to 1991, the number of fish using the ladder declined by 94 percent, and the average size ascending the ladder diminished from twelve to 7 inches (Hanel and Gerlach 1964; Hemmingsen 1997).

The Project directly impacts redband trout survival through entrainment and stranding during down-ramping and indirectly affects their habitat through changes in hydrology, geomorphology, water quality, and riparian resources. Many of these impacts are discussed in the following sections on the J.C. Boyle peaking reach, bypassed river reach, and dam.

C. Anadromous Fish Species

1. Chinook Salmon

Chinook salmon support a wide variety of valuable commercial, recreational, and Tribal fisheries in California, Oregon, Washington, and Alaska. Currently they spawn in suitable rivers from the Sacramento-San Joaquin river system northward through British Columbia and Alaska, as well in northeast Asia. The National Research Council (National Research Council 1996) reported that Pacific salmon have disappeared from about 40 percent of their historical breeding ranges in Washington, Oregon, Idaho, and California, and that many of the remaining populations are severely depressed.

Historical records indicate that Chinook salmon were distributed throughout the Klamath River Basin, including above the current site of Iron Gate Dam (Hamilton et al. 2005). Chinook salmon historically spawned in the Williamson and Sprague Rivers above Upper Klamath Lake (Fortune et al. 1966; Lane and Lane Associates 1981), but quantitative assessments of anadromous fish distribution are lacking. Major Tribal harvest stations were located well upstream in the Sprague River, and salmon spawning was reported in the North and South Forks of the Sprague River.

Chinook salmon exhibit many life-history strategies, including variation in age at seaward migration, variation in length of freshwater and estuary residence, variation in ocean distribution and migration patterns, and variation in age and season of spawning migration (Healey 1991 in Groot and Margolis 1991). Snyder (1931) reported that spawning Chinook salmon appeared to enter the Klamath River at all seasons, with peak abundances occurring in the spring and the mid-summer to early fall periods. Both spring and fall run Chinook spawned in areas above the current location of the Project, but were cut off from perhaps 40 percent of the available habitat by completion of Copco I Dam in 1918.

The spring and fall runs are the two primary runs known in the Klamath system. Although spring-run Chinook were the dominant run historically (Gatschet 1890; Spier 1930), this run has now been reduced to remnant status, with only a few hundred fish spawning in the wild. The only substantial spring run remaining in the Klamath watershed spawns at Lewiston Hatchery on the Trinity River. In the wild, adult spring run fish hold in deep cool pools during the summer before spawning, and juveniles may also over-summer in riverine habitat. This habitat type has been substantially reduced by human activity in the 19th and 20th centuries (National Research Council 2003).

Fall-run Chinook are now the predominant Chinook run in the basin. This run is confined to the Klamath River and tributaries downstream of Iron Gate Dam, and to the Trinity River and tributaries downstream of Lewiston Dam. Fall run Chinook enter the river in late August, September, and early October. They spawn in the main rivers, in numerous tributaries, and at Iron Gate and Lewiston Hatcheries. Juveniles depart the river in late spring and summer at less than one year of age. Spawning fish return at age 3 and 4. Numbers of fall Chinook salmon

returning to the river in 1978-2003 averaged approximately 125,600 fish per year, and ranged from 34,000 fish in 1991 to 239,000 fish in 1986 (CDFG unpublished data). The coast wide salmon Fishery Management plan (FMP) developed by the Pacific Fishery Management Council includes a conservation goal for Klamath river fall Chinook (measured as fish spawning naturally in streams) of 33-34 percent of potential spawners in each brood while providing a minimum of 35,000 adult spawners to natural spawning areas each year (Myers et al. 1998; Pacific Fishery Management Council 2003).

Providing Chinook salmon access to their historical habitat range could substantially increase Klamath Basin populations, but we cannot determine with certainty how much overall Basin productivity would increase. Developing estimates of the historical anadromous fish production from above Upper Klamath Lake prior to habitat degradation is also difficult. However, the dams block access to more than 340 miles of river (not including areas currently inundated by project reservoirs) which probably produced large numbers of Chinook salmon. Despite the uncertainties associated with estimating potential current or historical production, it is reasonable to expect that substantial runs of anadromous fish can be restored to the areas above Iron Gate Dam.

2. Steelhead

Steelhead are the anadromous form of coastal rainbow trout. Historically, steelhead trout occurred in coastal river systems ranging from Alaska, British Columbia, Washington, Oregon and California, to the Tijuana River in northern Mexico (National Research Council 1996). The current southern limit of steelhead distribution is Malibu Creek in southern California (Busby et al. 1996), but occasional spawning may occur in a few streams farther south. In the Klamath system, steelhead formerly occurred far up into tributaries of Upper Klamath Lake, and were important to the Klamath Tribes.

Unlike other salmon species, steelhead do not typically die after spawning and may spawn several times during their lifespan. Steelhead may migrate into the Klamath River at any time of the year, but peak spawning runs occur in the fall, winter, and summer periods (Barnhart 1994; Busby et al. 1996; USDI 1985; Shaw et al. 1997). In general, summer steelhead migrate into the river from March through June. Fall steelhead typically migrate in August through November, and winter-run steelhead migrate in December through March. Winter-run fish enter the river sexually mature, while summer-run fish enter the river in a sexually immature condition and require several months to mature and spawn. They migrate far up into small streams and use habitats inaccessible to larger salmon species. Fry hatch in March through June and the juvenile fish spend one or two years in the stream prior to moving out into the mainstem river (Shaw et al. 1997).

CDFG (2001) reported that the Klamath River system supported the largest population of steelhead in the state. From 1977-1983 steelhead populations ranged from 87,000-181,410 adults annually, including the Trinity River; however, steelhead have declined dramatically in

the Klamath River, most likely due to high summer water temperatures in the mainstem river (CDFG 2001). Even so, a substantial recreational steelhead fishery remains on the river.

Developing estimates of the historical steelhead production from above UKL prior to habitat degradation is difficult. Currently, abundant populations of redband trout occupy the areas presently considered suitable for anadromous steelhead. Providing access to their historical habitat range could substantially increase Klamath Basin steelhead populations. The dams block access to more than 300 miles of stream habitat which could once again produce substantial numbers of steelhead (Huntington 2006).

3. Pacific Lamprey

Pacific lampreys are the most widely distributed lamprey species on the west coast of the United States. Their distribution includes major river systems such as the Fraser, Columbia, Klamath-Trinity, Eel, and Sacramento-San Joaquin Rivers. Pacific lamprey distribution patterns are similar to anadromous salmonids (Close et al. 1995; Close et al. 2002; Simpson and Wallace 1978). Adult Pacific lampreys parasitize a wide variety of ocean fishes, including Pacific salmon.

Pacific lamprey is an important traditional food source for members of the lower river Tribes. Harvest techniques include hand, dip nets, and, most commonly, hooking. Lampreys do not provide sport or commercial fisheries in the Klamath River.

After spending 1 to 3 years in the marine environment, Pacific lampreys return to freshwater between February and June (Kostow 2002; Moyle 2002). They are thought to overwinter and remain in freshwater habitat for approximately 1 year before spawning. Prior to construction, anadromous Pacific Lamprey were distributed above the site of Iron Gate Dam (Coots 1957; Kroeber and Barrett 1960) and are now blocked from a considerable portion of their historical habitat.

Information on the historical and current distribution and abundance of Pacific lamprey in the Klamath River basin is limited. Anecdotal evidence from early historical accounts and Tribal interviews suggest that Pacific lampreys have undergone substantial declines in the lower Klamath River in recent decades. Preliminary analysis of rotary trap data from the Klamath and Trinity Rivers suggests a declining trend from 1997 to 2004 for all life stages, with a notable decline in adult captures for the Klamath River system (USDI Fish and Wildlife Service 2004b). Limitations of these data for evaluating trends include uncertainty about consistency in reporting lampreys, and a lack of standardized counts at dams over time designed to document lamprey (Close et al. 1995). In addition, data based on ammocoete counts can include the similar-appearing western brook and river lampreys.

In January 2003, the Service received a petition to list the Pacific lamprey and three other lamprey species in Oregon, Washington, Idaho, and California. The Service found that that the petition and additional information in our files did not present substantial scientific or

commercial information indicating that listing these species may be warranted (USDI Fish and Wildlife Service 2004b).

TERRESTRIAL RESOURCES

Threatened and Endangered Species

1. Bald Eagle

In recent decades, bald eagle populations in the continental U.S. have rebounded from low levels of the 1970s. The Service recently reopened the public comment period for a proposal to remove the species from the list of Threatened and Endangered Species (71 Federal Register 8238). Recovery goals for the Pacific Recovery Region, which includes Oregon and California, have been met. Protection will continue under the Bald and Golden Eagle Protection Act, potentially including newly proposed regulations regarding disturbance (71 Federal Register 8265) and new National Bald Eagle Management Guidelines (71 Federal Register 8309). The species remains under the protection of the laws of Oregon and California, as well.

About ten bald eagle nesting areas are known within the Project area. Waters of the Project probably provide the primary fish prey source for this population. It is anticipated that provision of passage for anadromous fish will provide increased forage sources for bald eagles in the region above the Project. Primary management concerns include avoidance of disturbance from recreational activities, and long term maintenance of nesting habitat. Management recommendations provided herein pursuant to Section 10(j) include measures in accordance with per the draft National Bald Eagle Management Guidelines. To the extent that state laws are more restrictive, those authorities will apply.

2. Northern Spotted Owl

The northern spotted owl was listed as threatened in 1990 (55 Federal Register 26114) and a status review was completed in 2005. Ordinary Project operations are not expected to affect this species. Activities related to potential construction of fish passage facilities will be subject to section 7 consultation under ESA; the necessity of protection measures will be evaluated at that time. No further measures are proposed herein.

3. Applegate's Milkvetch

Applegate's Milkvetch is a plant listed as endangered under the ESA in 1993 (58 Federal Register 40547). According to the species' Recovery Plan, this species occurs in alkaline flood basin grassland near Klamath Falls, Oregon. Project operations are not expected to affect this species, and no measures for the species are proposed herein.

KLAMATH HYDROELECTRIC PROJECT IMPACTS

Relicensing of the Klamath Hydroelectric Project would continue the impacts that have affected the Klamath River over the past 90 years. These include the loss and fragmentation of large amounts of habitat for resident and anadromous fish, including important thermal refugial habitats, loss of ecosystem functioning through returning anadromous fish to the Project area and upstream, alteration of the natural hydrologic regime of the Klamath River, the effects of water impoundment by five dams, and the effects of hydroelectric peaking at two dams.

A. Habitat Fragmentation and Loss

The Applicant proposes to continue to inundate a total of 14.1 miles of riverine channel with Project reservoirs over the next license term. Much of this was low gradient river channel which would have supported resident and anadromous fish populations better than habitat in reservoirs. Project reservoirs created lacustrine habitat which contributed to fish community shifts that favor mostly non-native species and impairs native species (Moyle 2002). The non-native species displace native species, compete for forage with native species, prey on native species, and subsequently limit the productive potential of native fish populations in reservoir-affected reaches.

1. *Resident Fish:* Within the project area, resident redband/rainbow trout inhabit the J.C. Boyle peaking, J.C. Boyle bypassed, Keno, and all other Project reaches of the Klamath River. Spawning occurs in the lower portion of the J.C. Boyle Bypassed River Reach and in Spencer and Shovel creeks. The lower 2.7 miles of Shovel Creek continue to provide good salmonid habitat and the reach of the Klamath River between the Oregon/California State line and Copco 1 Reservoir has been designated Wild Trout water and is currently managed under the Wild Trout Program by the California Department of Fish and Game (CDFG 2005). Fish passage among these habitat areas is strongly impaired by the Klamath Hydropower facilities.

2. *Anadromous Fish:* Lack of fish passage at the Klamath Project facilities has blocked access to much of the Klamath River Basin. Within the Project area, 58 miles of habitat are blocked, including six important tributaries and 12 minor tributaries that offer productive areas, cooler waters, and diverse habitats. These include Fall, Jenny, Scotch, and Camp creeks flowing into Iron Gate Reservoir, Shovel Creek flowing into the J.C. Boyle Peaking Reach, and Spencer Creek flowing into J.C. Boyle Reservoir. More than 300 miles of migration, spawning, and rearing habitat for salmon, steelhead, and Pacific lamprey is no longer accessible in the Upper Basin. Much of this historic habitat continues to provide a productive environment for redband trout and, at some locations bull trout, brown trout *(Salmo trutta)*, and brook trout *(Salvelinus fontinalis).* This habitat above the current location of Project dams is still capable of supporting salmon, steelhead, and lamprey.

B. Loss of Ecosystem Function

When anadromous fish are present, they are an important source of energy and nutrients for subsequent generations of salmon and to maintain proper ecological function (Stockner 2003). In the Klamath River above Iron Gate Dam, anadromous fish previously provided nutrient input from the marine environment that is no longer available due to this Project.

C. Alteration of the Natural Hydrologic Regime

The Klamath Hydroelectric Project has significantly altered the natural hydrologic pattern and functioning of the Klamath River within the project reaches and downstream. The ecological structure and functioning of aquatic, wetland, and riparian ecosystems depend largely on the hydrologic regime, or pattern and quantity of water flowing through the system (Gorman and Karr 1978; Junk et al. 1989; Mitsch and Gosselink 1993; National Research Council 1992; Poff et al. 1997; Poff and Ward 1990; Sparks 1992). Intra-annual variation in hydrologic conditions plays an essential role in the dynamics among species within such communities through influences on reproductive success, natural disturbance, and biotic interactions (Poff and Ward 1989). Modifications of hydrologic regimes can indirectly alter the composition, structure, and functioning of aquatic, riparian, and wetland ecosystems (Bain et al. 1988; Dynesius and Nilsson 1994; Lillehammer and Saltveit 1984; Stanford and Ward 1979; Ward and Stanford 1983; Ward and Stanford 1989)). Project alterations to the hydrologic regime include the impacts associated with impounding waters at five dam sites, use of storage to change the timing of flows through hydroelectric dams and river reaches to maximize revenues, diverting the majority of flows from bypassed reaches of the Klamath River to maximize power production, and ramping river water surface elevation rapidly.

D. Impoundment Impacts

1. *Water Temperature:* Project impoundments have caused water temperatures to be warmer in fall and cooler in spring than under without Project conditions.
2. *Dissolved Oxygen:* Project impoundments cause dissolved oxygen (DO) concentrations in water to fall below levels that are needed by fish.
3. *Nutrient Loads*: Project impoundments impair the assimilation of excess nutrients, exacerbating already high biological oxygen demands and low DO concentrations in Klamath River water.
4. *Disease:* Project effects such as the maintenance of high nutrient levels and lack of peak flushing flows may be contributing to increased densities of anadromous fish parasites.
5. *Toxic Algae Blooms:* Toxic algae blooms (*Microsystis* sp.) in Project reservoirs may be impacting fish condition in reservoirs and downstream.
6. *Gravel Depletion:* Project reservoirs block the natural migration of sediments, including gravels used by trout and salmon for spawning.

E. Effects of Hydroelectric Peaking Operations

Hydroelectric peaking operations are used to maximize hydroelectric revenues by maximizing power generation when demand is greatest. Storage at J.C. Boyle and the Copco Reservoirs is used to manipulate flows through the powerhouses to a constant, elevated level during the afternoon and early evening and to minimum levels at night and in the morning. Such operations at the J.C. Boyle Powerhouse result in large, artificial, daily fluctuations in flows in the J.C. Boyle peaking reach, but flows exiting the Copco Powerhouse enter Iron Gate Reservoir directly, avoiding river reach flow fluctuations. Such large flow fluctuations result in high mortalities of many aquatic populations from physiological stress, wash-out during high flows, and stranding during rapid dewatering (Cushman 1985; Petts 1984). Frequent dewatering can result in massive mortality of bottom-dwelling organisms and subsequent severe reductions in biological productivity (Weisberg et al. 1990). Frequent flow fluctuations severely impair the rearing and refuge functions of shallow shoreline or backwater areas for small fish species or young life stages of larger fish (Bain et al. 1988; Stanford 1994).

1. *Reduced Flows in Bypassed River Reaches:* Most of the water that would enter the J.C. Boyle and Copco 2 Bypassed Reaches of the Klamath River is diverted for power generation. Only 100 cfs normally is released in the J.C. Boyle bypassed reach and only 5 cfs normally is released in the Copco 2 bypassed reach. The quantity and quality of aquatic habitats have been severely reduced in these reaches due to this great amount of dewatering.
2. *Trout Growth:* Resident Redband/rainbow trout growth is impaired by the adverse effects of artificial flow fluctuations in the Peaking Reach.
3. *Abundance of Macroinvertebrates:* Hydroelectric peaking greatly decreases the abundance of macroinvertebrate prey for redband/rainbow trout in the Peaking Reach.
4. *Fish Movement:* Increased energetic costs of movement due to artificial flow fluctuations in the peaking reach impact the existing resident fish and would impact reintroduced anadromous fish in the Peaking Reach.
5. *Water Quality:* Hydroelectric peaking causes severe fluctuations in temperature that adversely affects fish.
6. *Stranding:* Hydroelectric peaking increases stranding probabilities through increased flow fluctuations.

ENDANGERED SPECIES ACT

Section 7 of the ESA, and its implementing regulations at 50 CFR 402.14, require Federal agencies to review their actions at the earliest possible time to determine whether any action may affect listed species or critical habitat. If such a determination is made, consultation with the Service is required. In the case of the Project, listed species of concern to the Department are present in the Project Area. They include the bald eagle (*Haliaeetus leucocephalus*), northern spotted owl (*Strix occidentalis caurina),* Lost River sucker, and shortnose sucker. Consequently, consultation with the Service under section 7 will be required to comply with the Act. The Department's fish and wildlife recommendations include provisions for incorporating ESA

reopener language in the new license. The Department also seeks to reduce Project impacts to listed species through our section 18 fish passage prescriptions, the FWCA, and section 10(j) recommendations.

The Department recommends that the Commission enter into consultation with the Service to cover adverse effects to listed species associated with the Project relicensing. In addition, as indicated in our comment letter to the Draft License Application dated September 24, 2003, the Department is concerned that take of listed species associated with current operations is not authorized under the ESA. The Department recommends that the Commission request a current list of ESA species in the Project area from the Service. The Commission should prepare a Biological Assessment (BA) to evaluate the potential effects of the Project on listed and proposed species, and determine whether any such species may be adversely affected by the action. Due to the complexity of this project, the BA should be separate from the draft EIS. Pursuant to the Act's implementing regulations at 50 CFR 402.08, the Commission has designated the Licensee as its non-Federal representative to conduct informal consultation or prepare a biological assessment. In order to ensure that the ESA process moves forward in coordination with the Commission's relicensing proceeding, informal consultation should begin soon. If the BA is prepared by the designated non-Federal representative, the Commission must furnish guidance and supervision, and must independently review and evaluate the scope and contents of the BA. The ultimate responsibility for compliance with section 7 remains with the Commission.

CONTINUING IMPACTS OF THE PROPOSED PROJECT

Many of the Department's recommendations, conditions, and prescriptions include requirements to address Project impacts that are occurring in the present and have been ongoing since the original license was issued over 50 years ago. To help assess these impacts and the mitigation needed to address them, the Commission's upcoming NEPA analysis should include information regarding the ongoing impacts of the Project. Inclusion of ongoing impacts in the Commission's NEPA analysis would allow for complete consideration of the Project's impacts, and provide a basis on which to assess the adequacy of proposed mitigation measures.

LITERATURE CITED

Bain, M. B., J. T. Finn and H. E. Booke (1988). "Streamflow Regulation and Fish Community Structure." Ecology **69**(2): 382-392.

Barnhart, R. A. (1994). Salmon and Steelhead Populations of the Klamath-Trinity Basin, California**:** 1-30.

Beak Consultants Inc. (1988). Shortnose and Lost River Sucker Studies: Larval Sucker Study between Copco Reservoir and the Proposed Salt Caves Diversion Pool (A Response to a FERC request for Additional Information). Klamath Falls, OR, City of Klamath Falls**:** 1-40.

Behnke, R. J. (1992). Native trout of western North America. Bethedsa, MD, American Fisheries Society.

Bell, M. C. (1986). Fisheries Handbook of Engineering Requirements and Biological Criteria.

Buettner, M. and C. Scoppettone (1991). Distribution and information on the taxonomic status of the Shortnose sucker, (Chasmistes brevirostris), and Lost River sucker, (Deltistes luxatus), in the Klamath River Basin, California. Reno Substation, Nevada, U.S. Fish and Wildlife Service; Seattle National Fishery Research Center**:** 1-101.

Busby, P. J., T. C. Wainwright, G. J. Bryant, L. J. Lierheimer, R. S. Waples, F. W. Waknitz and I. V. Lagomarsino (1996). Status Review of West Coast steelhead from Washington, Idaho, Oregon, and California. Long Beach, CA, National Oceanic and Atmospheric Administration**:** 1-261.

Close, D. A., M. S. Fitzpatrick, H. Li, B. Parker, D. Hatch and G. James (1995). Status report of the Pacific lamprey (*Lampetra tridentata*) in the Columbia River Basin. Portland, OR, U. S. Department of Energy, Bonneville Power Administration Environment, Fish and Wildlife.

Close, D. A., M. S. Fitzpatrick and H. W. Li (2002). "The ecological and cultural importance of a species at risk of extinction, Pacific Lamprey." Fisheries **27**(7): 19-25.

Coots, M. (1957). The spawning efficiency of king salmon (*Oncorhynchus tshawytscha*) in Fall Creek, Siskiyou County. 1954-55 Investigations. Redding, CA, Inland Fisheries, California Department of Fish and Game**:** 15 pages.

Cushman, R. M. (1985). "Review of ecological effects of rapidly varying flows downstream from hydroelectric facilities." North American Journal of Fisheries Management **5**: 330-339.

Desjardins, M. and D. F. Markle (2000). Distribution and Biology of Suckers in Lower Klamath Reservoirs. Portland, OR, PacifiCorp**:** 1-76.

Dynesius, M. and C. Nilsson (1994). "Fragmentation and Flow Regulation of River Systems in the Northern Third World." Science **266**(5186): pp. 753-762.

Fortune, J. D., A. R. Gerlach and C. J. Hanel (1966). A study to determine the feasibility of establishing salmon and steelhead in the Upper Klamath Basin. Portland, OR, Oregon State Game Commission and Pacific Power and Light Company.

Gatschet, A. S. (1890). The Klamath Indians of Southwestern Oregon, USDI U.S. Geographical and Geological Survey of the Rocky Mountain Region**:** 1-106.

Gorman, O. T. and J. R. Karr (1978). "Habitat Structure and Stream Fish Communities." Ecology **59**(3): 507-515 pp.

Groot, C. and L. Margolis, Eds. (1991). Pacific Salmon - Life Histories. Vancouver, BC, UBC Press University of British Columbia.

Hamilton, J. B., G. L. Curtis, S. M. Snedaker and D. K. White (2005). "Distribution of anadromous fishes in the upper Klamath River watershed prior to hydropower dams - a synthesis of the historical evidence." Fisheries **30**(4): 34 pages.

Hanel, J. and A. R. Gerlach (1964). Klamath River flow study at J.C. Boyle project. Portland, OR, Pacific Power and Light Company**:** 1-68.

Healey, M. C. (1991). Life History of Chinook Salmon (*Oncorhynchus tshawytscha*). Pacific Salmon Life Histories. C. Groot and L. Margolis. Vancouver, University of British Columbia Press.

Hemmingsen, A. (1997). Klamath River Hydro Issues, Oregon Department of Fish and Wildlife**:** 23 pages.

Junk, W. J., P. B. Bayley and R. E. Sparks (1989). "The Flood Pulse Concept in River-Floodplain Systems." Canadian Special Publication in Fisheries and Aquatic Sciences **106**: 110-127 pp.

Klamath Fishery Management Council (1991). The Klamath Fishery Management Council Strategic Plan for Management of Harvest of Anadromous Fish Populations of the Klamath River Basin. Yreka, California**:** 1-`33.

Kostow, K. (2002). Oregon Lampreys: Natural History Status and Analysis of Management Issues**:** 4 and 8.
Kroeber, A. L. and S. A. Barrett (1960). Fishing Among the Indians of Northwestern California. Anthropological Records 21:1 Fishing Among the Indians of Northwestern California. J. H. Rowe, R. F. Heizer, R. F. Murphy and N. E. Berkely and Los Angeles, CA, University of California Publications. **21:** 4-5.
Light, J., L. Herger and M. Robinson (1996). Upper Klamath Basin Bull Trout Conservation Strategy - Part 1 - A Conceptual Framework for Recovery, The Klamath Basin Bull Trout Working Group**:** 88 pages.
Lillehammer, A. E. and S. J. E. Saltveit (1984). Regulated Rivers. Oslo, Norway, Universitetsforlaget AS.
McCullough, D. A. (1999). A Review and Synthesis of Effects of Alterations to the Water Temperature Regime of Freshwater Life Stages of Salmonids, with Special Reference to Chinook Salmon, Columbia River Inter-Tribal Fish Commission**:** 3 pp.
Mitsch, W. J. and J. G. Gosselink (1993). Wetlands. New York, NY, John Wiley & Sons, Inc.
Moyle, P. B. (2002). Inland fishes of California (second edition), University of California Press.
Myers, J. M., R. G. Kope, G. J. Bryant, D. J. Teel, L. J. Lierheimer, T. C. Wainwright, W. S. Grand, F. W. Waknitz, K. Neely, S. T. Lindley and R. S. Waples (1998). Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California, U. S. Department of Commerce**:** 443 pp.
National Marine Fisheries Service (1997). "Endangered and Threatened Species; Threatened Status for Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU) of Coho Salmon - Final rule." Federal Register **62**(87): 24588-24609.
National Research Council (1992). Restoration of Aquatic Ecosystems - Science, Technology, and Public Policy. Washington, DC, National Academy Press.
National Research Council (1996). Upstream: Salmon and Society in the Pacific Northwest. Washington, D.C., National Academy Press.
National Research Council (2003). Endangered and Threatened Fishes in the Klamath River Basin - Causes of Decline and Strategies for Recovery. Washington, D. C., U. S. Department of Interior and U. S. Department of Commerce**:** 1-334. (pre-publication)
National Research Council (2004). Endangered and Threatened Fishes in the Klamath River Basin - Causes of Decline and Strategies for Recovery. Washington, D. C., U. S. Department of Interior and U. S. Department of Commerce**:** 1-334. (published version)
Oregon Department of Fish and Wildlife (1997). Klamath River Basin Fish Management Plan. Portland, Oregon**:** 176 pages.
Pacific Fishery Management Council (2003). Pacific Coast Salmon Plan - Fishery Management Plan for Commercial and Recreational Salmon Fisheries Off the Coasts of Washington, Oregon and California as Revise Through Amendment 14 (Adopted March 1999). Portland, OR, Pacific Fishery Management Council**:** 1 through 12-2.
Petts, G. E. (1984). Impounded Rivers - Perspectives for Ecological Management Chichester, UK, John Wiley and Sons.
Poff, N. L., J. D. Allan, M. B. Bain, J. R. Karr, K. L. Prestegaard, B. D. Richter, R. E. Sparks and J. C. Stromberg (1997). "The Natural Flow Regime - A Paradigm for River Conservation and Restoration." BioScience **47**(1): 769-784.
Poff, N. L. and J. V. Ward (1989). "Implications of Streamflow Variability and Predictability for Lotic Community Structure: A Regional Analysis of Streamflow Patterns." Canadian Journal of Fisheries and Aquatic Sciences **46**(10): pp. 1805-1818.
Poff, N. L. and J. V. Ward (1990). "Physical Habitat Template of Lotic Systems: Recovery in the Context of Historical Pattern of Spatiotemporal Heterogeneity." Environmental Management **14**(5): 629-645 pp.
Rieman, B. E. and J. D. McIntyre (1995). "Occurrence of bull trout in naturally fragmented habitat patches of varied size." Transactions of the American Fisheries Society **124**(3): 285-296.
Sandercock, F. K. (1991). Life History of Coho Salmon (*Oncorhynchus kisutch*)**:** 397, 403, 420.
Scoppettone, G. G. and G. Vinyard (1991). Life History and Management of Four Endangered Lacustrine Suckers. Battle Against Extinction. W. L. Minckley and J. E. Deacon**:** 359-377.
Shapovalov, L. and A. C. Taft (1954). "The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (O*ncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management." California Department of fish and Game, Fish Bulletin **98**: 1-375.

Shaw, T. A., C. Jackson, D. Nehler and M. Marshall (1997). Klamath River (Iron Gate Dam to Seiad Creek) Life Stage Periodicities for Chinook, Coho and Steelhead. Arcata, CA, USDI Fish and Wildlife Service**:** 43 pages.

Simpson, J. C. and R. L. Wallace (1978). Fishes of Idaho, The University Press of Idaho.

Sparks, R. E. (1992). Risks of Altering the Hydrologic Regime of Large Rivers. Advances in Modern Environmental Toxicology (Chapter 9). P. D. M.A. Mehlman, Princeton Scientific Publishing Co., Inc. **Volume XX - Predicting Ecosystem Risk:** 119-152 pp.

Spier, L. (1930). Klamath Ethnography. Berkeley, CA, University of California Press.

Stanford, J. A. (1994). Instream Flows to Assist the Recovery of Endangered Fishes of the Upper Colorado River Basin. Washington, DC, U.S. National Biological Survey**:** 47 pp.

Stanford, J. A. and J. V. Ward (1979). Stream Regulation in North America. The Ecology of Regulated Streams. J. A. Stanford and J. V. Ward, Plenum Press**:** 215-236 pgs.

Stockner, J. G. (2003). Nutrients in Salmonid Ecosystems: Sustaining Production and Biodiversity. American Fisheries Society, Symposium 34, Bethesda, Maryland, American Fisheries Society.

U. S. Department of the Interior (1985). Klamath River Basin Fisheries Resource Plan. Yreka, CA, U.S. Department of the Interior**:** 1-300.

U. S. Department of the Interior (1997). Secretarial Order on American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act.

USDI Bureau of Land Management (2005). Cascade-Siskiyou National Monument - Proposed Resource Management Plan/Final Environmental Impact Statement. Medford, OR**:** 230 pages.

USDI Bureau of Reclamation (2000). Klamath Project - Historic Operation, USDI Bureau of Reclamaiton, Mid-Pacific Region, Klamath Basin Area Office**:** 53 pages.

USDI Fish and Wildlife Service (1988). "Endangered and threatened wildlife and plants: Determination of endangered status for the shortnose sucker and Lost River sucker." Federal Register **53**(137): 27130-27134.

USDI Fish and Wildlife Service (1994). Action Plan for Fishery Resources and Aquatic Ecosystems, U. S. Department of the Interior**:** 1-16.

USDI Fish and Wildlife Service (1998). "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout." Federal Register **63**(111): 31647-31674.

USDI Fish and Wildlife Service (2001a). Biological Opinion on the Bureau of Reclamations' Proposed Operation of the Klamath Project., signed by the Manager, California/Nevada Operations Office.

USDI Fish and Wildlife Service (2002). Klamath River Recovery Unit Chapter of the Bull Trout Draft Recovery Plan. Portland, OR, U.S. Fish and Wildlife Service, Region 1**:** 82 pages.

USDI Fish and Wildlife Service (2004a). "Endangered and threatened wildlife and plants: designation of critical habitat for the Klamath River and Columbia River populations of bull trout." Federal Register **69**(193): 59996-60075.

USDI Fish and Wildlife Service (2004b). "Endangered and threatened wildlife and plants; 90 day finding on a petition to list three species of Lampreys as threatened or endangered." Federal Register **69**(247): 77158-77167.

USDI Fish and Wildlife Service (2005). Memorandum to the files from Jim Stow for the Klamath Hydroelectric Project, FERC #2082 re: Assessment of Current and Necessary J. C. Boyle and Keno Fishways. Portland, OR, Fish Passage Engineer**:** 4 pages.

USDI Klamath River Basin Fisheries Task Force (1991). Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program, Prepared with the assistance of William M. Kier Associates, U. S. Fish and Wildlife Service, Yreka, CA.

USDI Klamath River Basin Fisheries Task Force (2001). Letter to PacifiCorp regarding: Comments on First Stage Consultation for Klamath Hydroelectric Project Relicensing (FERC No. 2082). Portland, OR.

Ward, J. V. and J. A. Stanford (1983). "The Intermediate Disturbance Hypothesis: An Explaination for Biotic Diversity Patterns in Lotic Ecosystems." Ann Arbor Science: 347-356 pp.

Ward, J. V. and J. A. Stanford (1989). "Riverine Ecosystems: The Influence of Man on Catchment Dynamics and Fish Ecology." Canadian Special Publication in Fisheries and Aquatic Sciences **106**: 56-64 pp.

Weisberg, S. B., A. J. Janicki, J. Gerritsen and H. T. Wilson (1990). "Enhancement of Benthic Macroinvertebrates by Minimum Flow From a Hydroelectric Dam." Regulated Rivers: Research & Management **5**: 265-277 pp.

Weitkamp, L. A., T. C. Wainwright, G. J. Bryant, G. B. Milner, D. J. Teel, R. G. Kope and R. S. Waples (1995). Status Review of Coho Salmon from Washington, Oregon, and California. Washington D.C., U. S. Department of Commerce.