



United States Department of the Interior

OFFICE OF THE SECRETARY
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Mr. Toby Freeman, Hydro Licensing Manager
PacifiCorp
825 N.E. Multnomah, Suite 1500
Portland, Oregon 97232

Subject: PacifiCorp Klamath River Hydroelectric Project Relicensing (FERC No. 2082)
Draft License Application

Dear Mr. Freeman:

In accordance with 18 C.F.R. § 16.8(c), the Department of the Interior (Department) provides the following comments to PacifiCorp on the draft license application for the Klamath River Hydroelectric Project (Project), FERC Project Number 2082.

Overview

The Department has reviewed the draft license application, and determined that it is substantially incomplete according to the terms of 18 CFR 16.8(c)(4) and 18 CFR 4.51. Existing study results are not compiled, analyzed, and presented. Agreed upon studies have not yet been completed, and it is uncertain as to whether they will be completed in time for use in developing the final license application. Resource impacts and protection, mitigation, and enhancement measures (PM&Es) are not identified. And the application is missing even basic elements, such as an estimate of dependable capacity, operating rule curves for the reservoirs, and identification of the Project boundary and federal lands.

PacifiCorp needs to complete study plans (First Stage Consultation). The enclosed comments from the Department's bureaus describe unmet information needs and specific concerns with study plans and the lack thereof. There remain unresolved issues in critical resource areas in which the Department has, through comments on the First Stage consultation document and participation in technical work groups with PacifiCorp and other stakeholders, identified potentially significant Project-related resource impacts and recommended specific studies and study methods to analyze those impacts. Critical areas with unresolved study issues include fish passage, characterizing the existing fish community, and studies of flow-related impacts.

PacifiCorp needs to compile and communicate study results, and to identify a proposed Project, resource impacts, and proposed protection, mitigation, and enhancement measures (Second Stage Consultation). The failure of PacifiCorp to

identify a proposed project results in a draft license application of little value. Further, since it lacks a proposed project, the draft license application also does not identify resource impacts or protection, mitigation, and enhancement measures. These are the three key purposes for preparing a draft license application. PacifiCorp needs to supplement its application with a proposed project, with additional studies, study results, and resource impacts, as well as proposed PM&Es in time for a joint meeting to identify substantive disagreements. At this time the Department is unable to identify areas of substantive disagreements (or agreements for that matter) regarding the resource impacts of the Project and the nature and scope of PM&Es because of the lack of information in the draft application. In order for PacifiCorp “to describe all disagreements with a resource agency or Indian tribe on technical or environmental protection, mitigation, or enhancement measures in its application” and comply with the requirements for the final application in 18 CFR 16.8(c)(8), the company should either provide a supplementary draft license application including resource impacts and PM&Es, or fully disclose positions in other written form prior to filing the final application with the Federal Energy Regulatory Commission (Commission or FERC).

The Department of the Interior in the Klamath Basin

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

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. For example, the Bureau of Reclamation is proposing to undertake a Klamath Basin Conservation Implementation Program (CIP). The overall aim of CIP is the recovery of several threatened and endangered fish, which will in turn provide greater certainty to the economy of the Klamath River basin including the Klamath basin agricultural sector. Similarly, the Fish and Wildlife Service has active programs in the basin for the protection and restoration of the aquatic habitat upon which endangered fish and fish available to tribes under treaty rights and fish available to commercial and sports fishers depend for spawning, growth and survival.

The Klamath River Basin Fishery Resources Restoration Act (or “Klamath Act”), was adopted by Congress in 1986, and directed the Secretary of the Interior to form the

Klamath River Basin Fisheries Task Force (Task Force), a Federal Advisory Committee, to provide advice on the recovery of anadromous fish runs of the Klamath River. The 16-member Task Force represents a cross-section of stakeholders, including Federal, State, county, Tribal, scientific, conservation, commercial and recreational fishing representation. A Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program (LRP) and Environmental Impact Statement (EIS) for the lower river was completed by the Task Force in 1991. The LRP has been filed with FERC. The LRP generally directs that fishery restoration is to be achieved through fish habitat protection and fish habitat restoration, from a total watershed perspective, not simply an in-stream perspective.

The Department has made working towards long-term solutions in the basin a priority, and committed significant resources to that effort. FERC's re-licensing process should ensure that licensing decisions are consistent with the comprehensive goals of these programs. The Department believes that actions taken as a result of this relicensing must mitigate the deleterious effects of the Project over the next license term. In that way, the relicensed Project can contribute to long-term basin-wide solutions. This is especially important in the context of this relicensing since the PacifiCorp dams in the Project are the cause of extirpation of the threatened coho salmon and other trust species such as Chinook salmon from all reaches and tributaries upstream of Iron Gate Dam.

The Department of the Interior in the Klamath Relicensing

PacifiCorp initiated the FERC licensing process in December 2000 and chose to use the traditional FERC licensing process. Interior and its bureaus, the Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Bureau of Reclamation (Reclamation), Fish and Wildlife Service (FWS), and National Park Service (NPS), have participated in the relicensing process since its inception.

Since its enactment in 1920, the Federal Power Act (FPA) has authorized Interior to participate directly in the hydropower licensing process. Pursuant to section 4(e), for example, Interior sets conditions necessary to protect the lands and resources Interior administers from the impacts of hydropower projects that occupy those lands. In this instance, these lands include the Bureau of Reclamation's Klamath Project and certain lands and projects managed by the BLM downstream of Keno Dam. Interior has trust responsibilities on behalf of Indian tribes and individuals when Indian trust and treaty resources are involved, as they are here. Interior also has the authority to establish, pursuant to section 18 of the FPA, terms for the safe passage of fish. Finally, Interior may recommend, pursuant to sections 10(a) and (j), conditions necessary to protect, mitigate impacts to, and enhance fish and wildlife, recreation, and cultural resources.

A unique relationship exists between the Federal government and Indian tribes. Interior acts to ensure the proper discharge of the Federal trust responsibilities to Indian tribes, a responsibility shared by all Federal agencies including the Federal Energy Regulatory Commission. With respect to interests potentially affected by the FERC-licensed Klamath Hydroelectric Project, five federally-recognized tribes reside in the Klamath

Basin in the geographic area affected by Project operations (Tribes): 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 Interior memoranda. The Tribes' fishing rights entitle them to harvest for subsistence, ceremonial, and commercial purposes.

In addition to the authorities and responsibilities identified above, Reclamation has established a business relationship with PacifiCorp in the operation of the Klamath Hydropower Project and the Klamath Basin Irrigation Project. That arrangement is the product of the relationships between the two projects and their dependence on each other. Reclamation currently operates the irrigation project under flow restrictions established by two Biological Opinions issued under the Endangered Species Act (ESA). These opinions require Reclamation to release water in a way that maintains minimum levels in the Upper Klamath Lake reservoir and at rates that assure certain flows in the Klamath River downstream of Iron Gate Dam. Any future operating criteria or estimates of hydropower project benefits must respect such limitations in determining the likely availability of power from the hydropower project so long as the fish species are listed as threatened or endangered under the ESA.

In addition, the reservoir established by Keno Dam provides certain services and benefits to the Klamath irrigation project. Because the draft application is silent on the likely new configuration of a re-licensed Project, it is not possible to determine if the new license will have an adverse effect on the irrigation project and what activities will be needed to protect its integrity.

Conclusion

The Klamath Project Collaborative Process Protocol (Process Protocol) was meant to augment, but not supercede, the duties and responsibilities set forth in the Traditional Licensing Process as identified in the Code of Federal Regulations (CFR), specifically 18 CFR Part 4 and 16. As noted in the Process Protocol (Process Protocol), the relicensing process was behind schedule when the collaborative process began. The incomplete draft application filed for the Project is evidence that the proceeding is still behind schedule for the traditional licensing process. As described in my April 8 letter to Toby Freeman, Interior remains concerned that PacifiCorp will not develop by the statutory filing deadlines an adequate administrative record upon which to base a public interest determination by FERC and Interior prescriptions and recommendations.

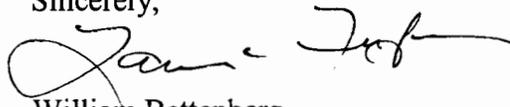
The completion of adequate studies and analyses by PacifiCorp is critical to understanding the effects of Project facilities and operations on resources of concern, developing a full range of Project alternatives, and exploring all options for improving management of fish and wildlife resources in the Klamath River watershed so that Interior can carry out its trust, contractual, and statutory responsibilities. Many of the incomplete study plans, such as fisheries and flow related studies, are critical to Interior's understanding of the impacts of the Project. Several critical studies have been conducted without agreement on appropriate methodologies, and there remain studies that Interior and other agencies have requested, but PacifiCorp has not agreed to pursue. A lengthy delay in issuing a new license may occur until an adequate evaluation of Project impacts can be made. This could result in unnecessary harm to sensitive resources through the ongoing and inadequately mitigated impacts of current Project facilities and operations. The Department sees strong indications of significant Project impacts. The lack of adequate, Project-specific, information limits our ability to tailor site-specific, cost-effective measures to this Project and may require Interior to prescribe conservative, protective measures. In order for PacifiCorp to meet its regulatory requirements, the company should either provide a supplementary draft license application including resource impacts and PM&Es, or fully disclose positions in other written form prior to filing the final application with the Commission.

Included in this submittal are the following documents:

- Enclosure 1: Comments of the Bureau of Indian Affairs
- Enclosure 2: Comments of the Bureau of Land Management
- Enclosure 3: Comments of the Bureau of Reclamation
- Enclosure 4: Comments of the Fish and Wildlife Service
- Enclosure 5: Comments of the National Park Service
- Enclosure 6: Comments of the Office of Policy Analysis

Interior encourages PacifiCorp to continue to work collaboratively with Federal, State, and Tribal governments and other stakeholders. The Department appreciates the opportunity to provide comments on the draft license application, and hopes that PacifiCorp will use them to address the significant shortcomings exhibited in its draft license application.

Sincerely,



for

William Bettenberg
Director, Office of Policy Analysis
Department of the Interior

cc: Magalie Salas, Federal Energy Regulatory Commission

COMMENTS OF THE BUREAU OF INDIAN AFFAIRS

The Bureau of Indian Affairs (BIA) has reviewed the draft license application for the Klamath River Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 2082 (DLA), and provides the following comments to PacifiCorp. The BIA's comments are organized into two sections. First, the BIA offers its general comments on the application. Second, the BIA provides specific comments with citation to the corresponding section of the DLA to which the comments apply. Also, it should be noted that these comments are limited to issues of particular concern to the BIA. There are a number of other issues that other Department of the Interior (Department) bureaus has commented on. The BIA hereby incorporates by reference those comments to the extent that they are consistent with the position of the BIA as expressed in this letter.

I. General Comments

The BIA appreciates the opportunity to comment on the DLA. While PacifiCorp has submitted a lengthy document, the BIA has found that the DLA is incomplete. Existing study results are not analyzed and presented, many agreed upon studies are not yet complete, and there are still unapproved study plans. Furthermore, resource impacts are not adequately identified and discussed, and the DLA fails to include proposed protection, mitigation, and enhancement measures (PM&Es) in most sections. Such keystone information is necessary not only to complete the application, but also to permit BIA's full review of this application. Without adequate, Project-specific information, the BIA's ability to develop recommendations for this Project is extremely limited. This is of particular concern for the BIA, because it is through such recommendations that the BIA and FERC carry out their tribal trust and statutory responsibilities.

As previously expressed during collaborative meetings with PacifiCorp and in an April 8, 2003 letter to PacifiCorp and FERC from the Department bureaus, the BIA has had and continues to have serious concerns about the timing and adequacy of the licensing process to date. In the April 8, 2003 letter, the Department stated:

“Interior is concerned with PacifiCorp's failure to complete study plans and how this will affect the development of an adequate draft license application. Specifically, the concern is that PacifiCorp will not develop an adequate administrative record upon which to base a public interest determination by FERC and Interior prescriptions and recommendations by the statutory filing deadlines.”

This concern has now been realized. The DLA is, in the BIA's view, inadequate in that it does not present an administrative record upon which to base recommendations regarding the terms and conditions of a new license for the Project. The licensing process is still far behind schedule and the BIA remains doubtful that PacifiCorp will be able to complete necessary studies, approve outstanding study plans, and adequately supplement the DLA in time for filing its final license application. The BIA also remains concerned about the status and scope of outstanding proposed study plans. As of the filing date of the DLA, ten of forty-five study plans remained unapproved due to study plan inadequacies and

disagreements over methodologies. Many of the incomplete studies are critical to the BIA's understanding of the impacts of the Project (such as fisheries and flow related studies). In addition there are still study plans that the Department and the BIA have requested, but that PacifiCorp has not agreed to pursue.

Because so much additional information must be generated and added to the DLA, the BIA will not articulate specific PM&E recommendations at this time. Instead, the following comments and recommendations are both preliminary and general in nature – we seek clarification, further discussion, and gathering of additional data. Hence, our comments and recommendations in response to the DLA necessarily will be revised and modified as needed.

The BIA strongly recommends that PacifiCorp provide a supplementary draft license application that includes resource impacts and PM&Es, or at a minimum, that PacifiCorp fully disclose all of the missing information in meetings held between today and February 2004 when the final license application must be filed with FERC. The BIA looks forward to continuing to work with PacifiCorp, state and federal resource agencies, the Tribes, and other the interested parties to insure that the deficiencies of the DLA are adequately addressed before PacifiCorp files its final license application.

A. The DLA is incomplete because it does not meet the regulatory requirements set out in 18 CFR § 16.8 and 18 C.F.R. § 4.51.

1. Consultation Requirements

According to 18 C.F.R. § 16.8(a), a potential applicant must consult with relevant Federal, State, and interstate resource agencies and Indian tribes *before* it files an application. 18 C.F.R. § 16.8(b) describes the information a potential applicant must provide to the agencies and tribes as part of the mandatory pre-filing consultation process. 18 C.F.R. § 16.8(b)(1)(iv) explicitly requires the applicant to identify the “environment affected or to be affected, the significant resources present and the applicant’s existing and proposed environmental protection, mitigation, and enhancement plans [PM&Es], to the extent known at that time.” PacifiCorp’s DLA, as submitted, fails to meet these consultation requirements primarily because it does not include the applicant’s existing or proposed PM&E’s for the Project. While this is still only a draft, the final license application is due in a matter of months, and it is reasonable to expect that PacifiCorp has an idea of what PM&E’s it intends to propose. To the extent PacifiCorp knows what it intends to propose, that information should have been included in the DLA pursuant to the regulations. The regulations require the identification and discussion of project impacts and PM&Es before filing a license application to provide the relevant agencies and tribes a meaningful opportunity to comment and to assist the applicant in developing the contents of an application. By failing to provide adequate required information, PacifiCorp has effectively denied the BIA, other agencies, and the tribes that opportunity.

18 C.F.R. § 16.8(c)(4)(i) deals even more specifically with the DLA itself, and provides that a “potential applicant must provide each resource agency and Indian tribe with a copy of its draft application that: (A) indicates the type of application [...]; and (B) responds to any comments and recommendations made by any resource agency or Indian Tribe either during the first stage consultation or under paragraph (c)(2) of this section.” At a minimum, PacifiCorp failed to respond in any meaningful way to the Department’s concerns expressed throughout the collaborative process and in the April 8, 2003 letter, especially as they relate to the significant delays in the consultation process and the development of requested study plans.

2. Application Content Requirements

18 C.F.R. § 4.51 describes the required contents of a final license application. § 4.51(f) describes Exhibit E, also referred to as the “Environmental Report,” of the application. By regulation, the Environmental Report must identify and discuss the impacts of the project on various aspects of the environment, including but not limited to water quality impacts, fish and wildlife impacts, and cultural and historical site impacts. Additionally, § 4.51(f) also requires identification of existing and proposed PM&Es to address those impacts. If the applicant rejects measures recommended by an agency, the applicant must also provide an explanation for why it has done so.

The DLA does not adequately identify and discuss project impacts (see Section II. of these comments below), nor does it include PM&Es. While 18 C.F.R. § 4.51 does not expressly address what contents must be included in a DLA, a DLA is intended to give agencies and tribes a preview of the final license application and an opportunity to offer meaningful substantive comments on the contents in advance of actual filing of the final application. By omitting much of the requisite contents for a final license application from the DLA, PacifiCorp has prevented the BIA and others from effectively commenting on the substance of the application at this time.

As mentioned above, PacifiCorp will be filing its final license application in less than five months, so it is difficult to believe that there are no plans for proposed PM&Es at this late juncture of the consultation process. The practical impact of the absence of PM&Es and adequate identification of resource impacts is that the BIA, and other parties, cannot accurately assess the Project’s impacts and hence cannot make informed recommendations. The BIA’s recommendations are the means by which the BIA exercises its tribal trust responsibilities in the FERC licensing process.

B. The Collaborative process does not relieve PacifiCorp of its obligations under the traditional FERC relicensing process.

In December 2000, PacifiCorp initiated the FERC licensing process and elected to use the traditional FERC licensing process. Two years later, in agreement with relevant Federal and State agencies and tribes, PacifiCorp agreed to simultaneously participate in a collaborative process known as the Klamath Project Collaborative Process Protocol

(Collaborative Process), to augment the traditional licensing process and work to resolve technical problems and issues related to study plan development.

The BIA is concerned that PacifiCorp has used the Collaborative Process to avoid traditional licensing requirements, while at the same time using its participation in the traditional process as a pretext to avoid making commitments in the Collaborative Process.

Throughout the Collaborative Process, when PacifiCorp has decided not to undertake certain studies requested or discussed by the various stakeholders, it has relied on the fact that it has chosen to use the traditional FERC licensing process. The standard response from PacifiCorp has always been that study requests not agreed to will be dealt with in the traditional FERC licensing when the appropriate time comes. However, in the traditional licensing process, PacifiCorp has continually relied on the Collaborative Process as a legitimate reason for falling behind schedule and failing to comply with traditional licensing processes and requirements. For example, throughout the DLA, PacifiCorp states that PM&Es will be developed through the Collaborative Process. At Page 1-1 of Exhibit E of the DLA, PacifiCorp states:

“The change in the level of collaboration during the second stage has extended the timeline on adopting and executing study plans; therefore, many studies are not yet completed. Given the outstanding status of some studies and the need to address Project impacts and PM&Es more collectively, this draft Exhibit E does not address PM&Es or continuing project impacts as is usual in the second stage of the licensing process.”

The BIA appreciates PacifiCorp’s willingness to collaborate, but not at the expense of failing to meet the requirements of the traditional process. The Collaborative Process does not supercede traditional licensing requirements.

Furthermore, although PacifiCorp states in its DLA that the Collaborative Process will be used as a forum for the further discussion of study results, discussion about project effects, and for the development of PM&Es, it is doubtful that PacifiCorp will complete necessary studies in progress or finalize remaining study plans and complete the associated studies prior to PacifiCorp’s submission of a final license application. It is unrealistic to assume that the current gaps in information, analyses, and mitigation development will be adequately completed in the next five months.

C. PacifiCorp must complete study plans, compile and share study results, and supplement the DLA with adequate identification and discussion of project impacts and proposed PM&Es.

Although the BIA does not expect that PacifiCorp will withdraw the DLA because it is incomplete, nor that the relicensing process will be delayed due to inadequate progress in information development, analyses, and mitigation development, the BIA would have more confidence in the process if PacifiCorp did resubmit a complete and robust DLA

prior to continuing. Alternatively, studies, analyses, and mitigation development will have to continue after an inadequate final license application is submitted to the FERC. In turn, it is likely that any license granted by the FERC will have to feature extensive “adaptive management” features and/or provisions for reopening the licensing process.

II. Section-Specific Comments

A. DLA Initial Statement

PacifiCorp notes that its application will be for a 50-year license for the existing Project. The BIA has concerns about a 50-year term; especially given the lack of information related to Project impacts and proposed PM&Es. Because the licensing process is so far behind schedule and so much information will not be available before PacifiCorp must submit its proposed PM&Es, it will be difficult for PacifiCorp to develop a set of PM&Es that will adequately protect resources and mitigate Project impacts over such a long period of time. If PacifiCorp takes a very conservative approach in its PM&Es, the BIA could potentially support a 50-year license term. However, with as little information as it has before it, currently the BIA does not support a 50-year term for the new license.

B. Exhibit E, Environmental Report

E3.0 Water Use and Quality

Three scenarios are planned for modeling, as per the approved study plan: 1) existing conditions, 2) run-of-river operations condition, and 3) a hypothetical “without-Project” condition. The DLA also notes that other scenarios may be developed based on work group discussions. Because of water quality problems in the Klamath River, it is essential that PacifiCorp prepare to model all possible Project facility and operation scenarios in order to facilitate considering the water quality implications of any such changes. This was discussed in several water quality work group meetings as part of the Collaborative Process.

PacifiCorp should provide details in its license application regarding the exact nature of its agreement with Reclamation about the operation of Link River Dam. For example, what is the active term of the agreement, and what form does it take? What types of Link River Dam operations will occur should the agreement no longer be in effect? This information is necessary to determine how instream flows will be affected should this agreement be modified or terminated during the term of the license the PacifiCorp is seeking.

This section of the DLA includes a discussion of ramping rates below Iron Gate Dam. Specifically, PacifiCorp states that Reclamation provides water that will allow PacifiCorp to meet Iron Gate Dam ramping rates outlined in NOAA Fisheries current biological opinion addressing operation of Reclamation’s irrigation project. The DLA does not mention that PacifiCorp is not currently obligated to meet those Iron Gate Dam ramping rates, and does not explicitly propose to do so.

During the effective life of the license that PacifiCorp is seeking, events may occur that remove this ramping guideline provided by NOAA Fisheries. Consequently, PacifiCorp should explicitly state that it will operate its Project to meet specific and appropriate ramping rates below Iron Gate Dam. In order to determine appropriate ramping rates, PacifiCorp should complete associated studies (e.g., those previously requested by NOAA Fisheries, or those proposed by PacifiCorp at other facilities within the Project boundaries). This information is needed to fully describe Project impacts, and develop appropriate PM&Es to address these impacts. These studies and measures will be necessary unless PacifiCorp can conclusively show how the previously stated resource management objectives will be met without such studies and associated ramping rates.

Similar to the ramping issue, PacifiCorp is not proposing to establish or implement minimum instream flows because, in their view, Reclamation “controls” Klamath River flows and maintains flows that are consistent with the current NOAA Fisheries biological opinion. As previously stated, events may occur that remove minimum Iron Gate Dam flows requirements imposed by NOAA Fisheries and implemented by Reclamation. Consequently, PacifiCorp should determine the appropriate minimum Iron Gate Dam flow regime through coordination with stakeholders and consideration of existing information and analyses, and propose to implement these flows. These measures will be necessary unless PacifiCorp can conclusively show how the previously stated resource management objectives will be met without an explicit, well-designed flow regime below Iron Gate Dam.

E4.0 Fish Resources

The DLA includes fishery management objectives that were communicated by the Klamath Basin Tribes to PacifiCorp in October 2000 (see section E 4.3 Fisheries Management Framework). These management objectives, shared by the BIA, include: 1) restoration of physical habitat, water quality, and water quantity, 2) hatchery operation that adequately mitigates for lost fish production while minimizing impacts to natural production, 3) restoration of fisheries downstream of Iron Gate Dam to sustainable harvest levels, 4) fish passage upstream of Iron Gate Dam, and 5) restoration of fisheries to historic levels and anadromous fish access to their historic range.

In order to address the various management objectives described in the DLA, PacifiCorp needs to provide adequate information to determine the Project impacts to water quality and the fishery, and to develop effective measures to minimize and mitigate those impacts. With respect to all of the Tribal and BIA interests, the BIA is concerned that PacifiCorp’s draft license application falls short of providing substantial information that PacifiCorp has developed to date, and information that will be required for the final license application as well as the National Environmental Policy Act (NEPA) document that FERC will be required to prepare. In addition, the studies to which PacifiCorp has agreed will not be sufficient to inform FERC’s NEPA process, as the information needed for a consideration of a wide range of alternatives (e.g., provision of fish passage) will not be provided.

Although the DLA includes a “placeholder” section for a discussion of the “continuing impact on fish resources from continued Project operations,” none are identified or discussed in the DLA. This seems disingenuous, given that the Fish Resources Draft Technical Report (DTR) states: “Project facilities and operations exclude native fish from historic habitats, and restrict and entrain some downstream migrants into Project facilities.” Further, the DTR states that PacifiCorp has “...an obligation...in the relicensing to assess the adequacy of existing fish passage facilities and to evaluate the need for additional facilities.” However, other than a brief reference to an unpublished and apparently unavailable report (Olson 2002), no studies of the effectiveness of existing passage facilities are mentioned in the DLA. Thus it is clear that PacifiCorp will either have to plan on upgrading existing passage facilities to meet current resource agency criteria, or otherwise provide effective fish passage. The BIA questions whether PacifiCorp will be able to develop such plans within the next 5 months, prior to submission of its final license application. Such plans and supporting studies will likely have to be developed and implemented during the post-filing period.

The Fish Resources DTR includes results from the fish population assessment work done to date. However, the discussion of every other fish-related study (e.g., Trout Movement in the JC Boyle Bypass and Peaking Reaches, Instream Flow Studies, Ramping and Flow Fluctuation Evaluations, Fish Passage Planning and Evaluation) did not include any results or analyses. Again, this situation will result in a delay of the important opportunity for stakeholders to review PacifiCorp’s study results and analyses. This too will make development of a refined description of Project effects and associated PM&Es within the next 5 months extremely unlikely.

In summary, the Tribal and BIA resource management objectives have been provided to PacifiCorp, these resource management objects have been reiterated in the DLA, project impacts related to fisheries have not been identified by PacifiCorp in the DLA, and PM&Es to address Project impacts have not been proposed.

Project impacts clearly include the continued blockage of access to fish habitat that was historically available. This, by definition, precludes achieving at least one of the Tribal fishery management objects, and can only be addressed by PacifiCorp modifying or removing selected facilities.

E4.1.1 Project Area

This section of the DLA states that the “study area” ends at the base of Iron Gate Dam. This seems inconsistent with descriptions of historical fisheries included later in the document, and suggests that the Project has no effect on fisheries below the dam.

Fishery Resources

Exhibit E of the DLA does not include a discussion of studies in progress that address fish passage, fish assessments, or hatcheries. Although the draft Technical Reports have some discussion of these items, the DLA should at least summarize these topics.

The DLA includes a list of incomplete study plans, and a disproportionate amount of these address fisheries issues: Study Plan 1.7, Ramping Evaluation, Study Plan 1.9 Fisheries Assessment, Study Plan 1.10 Fish Passage Planning and Evaluation, Study Plan 1.12 Instream Flow Analysis, Study Plan 1.16 Evaluation of Flow Fluctuation on Aquatic Resources within the J.C. Boyle Peaking Reach, and Study Plan 1.18 Investigation of Juvenile Anadromous Fish Behavior and Survival Through Upper Klamath Lake and the Hydroelectric Project.

Although some of these studies are proceeding without approval of the “collaborative,” which in itself is problematic, it is extremely unlikely that these studies will be concluded and the results analyzed prior to PacifiCorp’s submission of their final license application. Without the information from these studies, the final application will be insufficient to satisfy Federal Power Act implementing regulations and will not provide the FERC with adequate information for their NEPA purposes. Therefore, as previously stated, studies, development of project impacts analyses, and development of mitigation measures will have to continue after the final license application is submitted.

The DLA indicates that there is substantial fish entrainment into the East Side and West Side powerhouse canals. Left unsaid is that this is a substantial Project impact to fish. Consistent with the Klamath Basin Tribes management objectives that were previously communicated to PacifiCorp, fish entrainment should be eliminated, minimized, or otherwise mitigated through effective PM&Es. As previously stated, it is doubtful that appropriate PM&Es will be developed prior to submission of the final license application. Therefore, it is likely that this issue will have to be addressed during the post-filing period.

The DLA briefly mentions the ODFW monitoring of the J.C. Boyle facility fish ladder for tagged rainbow trout in 1988 and 1999. Also the Fish Resources Draft Technical Report (DTR) mentions a study by Olson (2002) which tried to determine why fish use of the J.C. Boyle ladder has decline dramatically since 1959. This literature (Olson 2002) is not included in the references and is not included in the DTR. Without access to this document, it is impossible to determine whether this is a robust study that adequately addressed the performance of the J.C. Boyle fish ladder. Also noted in another section of the DTR is that the ladder and intake screen are not consistent with current resource agency criteria for such facilities.

In the DLA, PacifiCorp proposes no additional studies of the J.C. Boyle fish ladder performance, and no modification or upgrading of this facility. An additional radio tracking study in the vicinity of J.C. Boyle is mentioned in the DTR, but without an opportunity to review the results to date, it is not possible to determine whether this study will be useful for evaluating ladder performance. Without an appropriate study that clearly shows that ladder performance is acceptable, PacifiCorp should propose

facilitating improved fish passage at this facility. The management goal to maintain and restore fish populations in this section of the Klamath River cannot be achieved without such connectivity. Similarly, PacifiCorp should propose to modify the existing power canal intake fish screen (and bypass) for consistency with contemporary resource agency criteria. Without conclusive evidence to the contrary, PacifiCorp and the various stakeholders must assume the fishery management objectives cannot be met without adequate protection from injury and entrainment.

The DLA offers a cursory description of Boyle Reservoir. However, the likelihood that the reservoir inundated prime trout spawning habitat is not mentioned. The inundation of fish spawning habitat is a continuing impact of the Project that is not being minimized or mitigated. Without conclusive evidence to the contrary, PacifiCorp and the various stakeholders must assume the fishery management goals cannot be met without appropriate Project modifications and/or mitigation for these impacts.

The DLA provides a brief identification and discussion of several tributaries to the Klamath River above Iron Gate Dam. Are these three tributaries the only ones that provide fishery values above Iron Gate Dam? We suggest that local resource agency offices could provide PacifiCorp a complete list of tributaries above Iron Gate Dam that provide fishery values and that, in turn, PacifiCorp include these in their fish-related assessments and analyses in the final license application.

The DLA does not include a discussion of the anadromous fish habitat above Iron Gate Dam that continues to be unavailable due to the Project. This is clearly a Project impact to fisheries, and must be thoroughly discussed. In order to develop necessary and appropriate minimization and mitigation measures to address these impacts, and in order to meet fishery management objectives, PacifiCorp must address this issue. Without conclusive evidence to the contrary, PacifiCorp and the other stakeholders must assume that this habitat is crucial to the success of one of the Tribal fisher management objectives: Reestablishment of anadromous fish access to the upper Klamath Basin.

E4.4 Consultation with Applicable Agencies, Tribes, and Public

This section of the DLA notes that a Fish Passage Work Group has met 19 times over two years to describe the impacts to aquatic resources including habitat, connectivity, and species interaction. Despite this effort, the DLA does not include any discussion about the effects of the Project on anadromous fish. A description of these effects must be developed and disclosed, and appropriate mitigation measures must be developed and implemented.

This section also briefly mentions that the group is addressing fish passage planning and evaluation using the Ecosystem Treatment and Diagnosis Methodology (EDT) and KlamRaz (passage) models. The DLA also indicates that the group is addressing studies of entrainment, and juvenile anadromous fish behavior and survival through the Project area. None of these studies have been approved by the Plenary group of the collaborative process. Also, aside from a single short paragraph in the DLA (Draft Exhibit E Page 4-

98), no details of any ongoing fishery modeling studies that PacifiCorp is conducting without the approval of the collaborative group are offered in the DLA. This situation is of particular concern because: 1) there is not enough time left prior to PacifiCorp's submission of their final license application to achieve Plenary approval of this study plan (1.10 Fish Passage Planning and Evaluation) and complete this study with adequate stakeholder coordination, 2) the suspected sensitivity of the models being used to assumption inputs (e.g., survival of juvenile outmigrant anadromous fish) is not being addressed, 3) PacifiCorp has not agreed to expand the scope of their modeling to include all habitat that would become available should anadromous fish passage be provided (consistent with collaborative group requests), 4) the lack of collaborative group approval of any measures of optimism for success of potential anadromous fish reintroduction above Iron Gate and Copco Dams, and 5) PacifiCorp has not acknowledged any Project effects on anadromous fish and has not proposed any Project modifications to enhance and/or enable fish passage.

It is clear that the Project continues to block anadromous fish passage, and that the current hatchery program only mitigates for lost anadromous fish production between Iron Gate and Copco dams (i.e., not for lost production due to the loss of habitat above Copco; see Draft Exhibit E Page 4-68). The Tribal management objective of restoring anadromous fish access to their historic range will not be met without provision of effective upstream and downstream fish passage. In lieu of completing robust studies, agreed to by stakeholders, that conclusively find that anadromous fish access to historic habitat cannot be restored, PacifiCorp should propose to modify existing fish passage facilities to be consistent with current resource agency criteria and provide effective passage at the Iron Gate and Copco Dams. Finally, the anadromous fish reintroduction feasibility modeling must use assumption inputs that have been thoroughly reviewed and agreed to by stakeholders, and must include consideration of all habitat that would be available if effective fish passage were provided.

E4.6 Proposed Enhancement Measures for Fish Resources

The section of the DLA states that it will provide "...an explanation of why PacifiCorp rejects any measures recommended by an agency." It seems that PacifiCorp has arrived at an inappropriate foregone conclusion that they will reject agency recommendations that they have not seen yet. This is particularly troubling, as the DLA provides no proposed PM&Es, no description of the continuing Project impacts to fish resources, and states that these two items will be developed within 5 months through discussions with the "collaborative" body.

E6.0 Cultural Resources

PacifiCorp's Cultural Resources Draft Technical Report (CR-DTR) at page 2-1 states:

At this time, the final project Area of Potential Effects (APE) has not been formally determined through consultation with the California and Oregon State

Historic Preservation Officer (SHPO) or the Yurok Tribal Historic Preservation Officer.

It is imperative that the APE be defined. According to Section 106 of the National Historic Preservation Act, and as outlined in the accompanying regulations at 36 CFR § 800.4, the APE should have been defined during the beginning stages of the planning process. It is the first step in the process of identifying and protecting cultural resources. Without a defined APE, it is extremely difficult to comment on the Cultural Resources section of the DLA.

One specific area of great concern for both the BIA and the tribes related to the delineation of the APE, involves the lack of cultural resources survey data within the Klamath River corridor downstream of Iron Gate Dam. The BIA and the tribes have consistently advocated that to the extent the Project could potentially impact cultural resources (including Traditional Cultural Properties and Sensitive Cultural Resources) below Iron Gate Dam, such resources should be identified early on so that Project impacts could be evaluated and PM&Es identified at the stage of the final license application. The early delineation of an APE (pursuant to 36 C.F.R. § 800 of the Advisory Council on Historic Preservation's regulations for agency compliance with the National Historic Preservation Act), provided it included the downriver corridor, would have facilitated the necessary studies being done in a timely manner. Because of the failure to identify the APE, the agreed-upon downstream studies are just now being commenced, thus too late to include the results in any project impact analysis in the DLA.

E8.0 Land Management and Aesthetics

It is not clear from this chapter how PacifiCorp has given any consideration to the protection of historic and cultural properties in the development of its management of lands within the project boundaries. Although Title 18 § 4.51 (f)(6) does not specifically mention historic and cultural resources, it is a logical extension that they should be accounted for in any land management planning. Since the DLA does not make clear how this issue will be addressed, PacifiCorp should at least explain how this will be addressed in the development of the Historic Properties Management Plan for compliance with the Section 106 of the National Historic Preservation Act.

E9.0 Socioeconomics

This section presents the usual socioeconomic data to characterize the existing conditions regarding population, housing, economic development, public services and infrastructure. However, no project impacts or PM&Es are presented since there are still outstanding studies to be completed. Part of the problem has been that although much discussion has been generated as the Socioeconomics Working Group attempted to develop an acceptable Study Plan or plans, there has not been full agreement on what should be included.

One of the key items of disagreement is whether the socioeconomic analysis should include a comprehensive benefit-cost analysis and consider the environmental and social effects of removing the project from the landscape. By projecting how this would alter future environmental and social conditions, a basis for comparison could be established to assess economic and environmental benefits.

Since the tribes are unanimous in wanting to see the Klamath River's ecosystem restored and a return to a healthy harvestable fish population and the associated hunting and gathering areas, the BIA recommends that PacifiCorp develop an acceptable study plan for addressing this issue. Protecting the trust resources of the tribes is a paramount responsibility of federal agencies when making decisions that could affect those resources. Since FERC will have that responsibility in the re-licensing process, it should have all the necessary study results to take into consideration.

III. Conclusion

The DLA is a useful document for describing the Project and the current status of the licensing process. However, it is substantially incomplete because it fails to adequately describe project impacts and PM&Es. Without such information, the BIA is severely limited in its ability to develop appropriate recommendations for the protection of tribal trust resources.

The BIA encourages PacifiCorp to continue to work collaboratively with the relevant Federal agencies, state governments, Tribes, and other stakeholders to remedy the shortcomings in the DLA. The BIA appreciates PacifiCorp's commitment to ongoing efforts to study and understand the Project's impacts, and we look forward to continuing to participate in an open and meaningful relicensing process.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Lakeview District Office
1301 South G Street
Lakeview, Oregon 97630
www.or.blm.gov/lakeview

In Reply Refer To:
9100/7000(014)

September 17, 2003

Toby Freeman
Hydro Licensing Manager
PacifiCorp
825 N.E. Multnomah, Suite 1500
Portland, OR 97232

Dear Mr. Freeman:

The Bureau of Land Management (BLM) appreciates the opportunity to comment on PacifiCorp's Draft License Application for the Klamath Hydroelectric Project, FERC Project No. 2082. The Draft License Application contains important information regarding PacifiCorp facilities, operations, and lands. We have conducted an extensive, in-depth review of the Draft License Application and our comments are detailed in the enclosed attachment.

As a multiple-use land management agency, the BLM has numerous resources to consider when reviewing the Draft License Application. Our comments reflect the diversity of our management objectives, from reducing hazardous fuels, to controlling noxious weeds, to providing habitat for threatened, endangered, and sensitive plant and animal species. In addition to utilizing interdisciplinary team members of the Klamath Falls Resource Area, we have coordinated our review and response with the Medford District Office and the Redding Field Office. We have also worked closely with the Interagency Technical Working Group that has been meeting for the past two years. Based on our review of the Draft License Application we have a number of concerns and recommendations.

While there was a great deal of interesting information provided by PacifiCorp in the Draft License Application, there were omissions of items important to the BLM including: completed study plans, results of the studies completed, proposed project description, and protection, mitigation and enhancement measures. In addition, there is still an outstanding question regarding the extent of the affected area and the actual boundary to be used for analyzing the Project affects. This is an important and very fundamental issue that should be resolved as soon as possible.

The Klamath Collaborative Process was convened to develop, conduct, and evaluate studies in order to establish a complete technical and scientific record necessary for developing the Draft License Application and Final License Application terms and conditions, PM&Es, and agency and Tribal recommendations and prescriptions. The work of the Klamath Collaborative over the last two years has emphasized study development, and the Collaborative has worked through many key issues. The BLM would like the Collaborative to focus more attention on the analysis

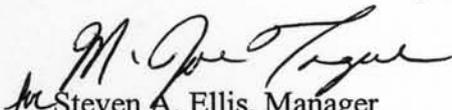
of existing data, model outputs, and existing scientific literature to adequately define Project impacts and necessary and sufficient mitigations for project impacts.

The BLM understands that FERC, in analyzing the proposed final license in accordance with the *National Environmental Policy Act* (NEPA), must develop an Environmental Impact Statement (EIS) that analyzes a full range of alternatives, including continuation of existing management to issuance of a non-power license or project retirement. The Environmental Report (Exhibit E) should contain information adequate to analyze a full range of alternatives. However, because many of the technical studies are incomplete, or results are lacking in detail, the Draft License Application does not provide this necessary information.

The relicensing process of the Klamath Hydroelectric Project is of vital importance to the Klamath Basin and the BLM. It is our responsibility to manage the public lands within and surrounding the Project in compliance with the numerous laws that govern us, particularly the Wild and Scenic River Act, Federal Land Policy and Management Act, the Endangered Species Act, the Clean Water Act, the Archeological Resources Preservation Act, and the Northwest Forest Plan. We are committed to working closely with PacifiCorp throughout the relicensing process.

Please contact me or Barbara Machado, our relicensing team leader at 541-947- 6184, if you have any questions. We look forward to working with you.

Sincerely,


for Steven A. Ellis, Manager
Lakeview District

Cc: Magalie Roman Salas, Federal Energy Regulatory Commission w/enclosure
William Bettenberg, (DOI) Washington D.C. w/enclosure
Nolan Shishido, Office of the Regional Solicitor w/enclosure
David Diamond, (DOI)
FERC: OR932/958
BLM, Lakeview District
BLM, Medford District
BLM, Redding Field Office



U.S. Department of the Interior
Bureau of Land Management

Lakeview District
1301 South G Street
Lakeview, Oregon 97630

September 2003

**RESPONSE TO DRAFT
LICENSE APPLICATION**

**KLAMATH
HYDROELECTRIC PROJECT**

FERC PROJECT 2082

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List of Preparers

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Introduction

The Bureau of Land Management (BLM), Lakeview District, is providing comments on PacifiCorp's Draft License Application for the Klamath Hydroelectric Project (FERC #2082) (Project). Three BLM Area Offices are affected by the Project. The Lakeview District is submitting comments on behalf of and in coordination with the Klamath Falls Resource Area, Lakeview District; the Redding Field Office; and the Ashland Resource Area, Medford District. This document provides an overview of BLM management direction and is the basis for enclosed BLM comments on the Draft License Application and the relicensing process.

This response is composed of three sections:

Part I provides an overview of BLM management direction.

Part II discusses global issues and concerns about the Draft License Application and relicensing process.

Part III details specific comments on the Draft License Application.

Part I: Bureau of Land Management Direction

The purpose of Part I is to provide an overview of Bureau of Land Management (BLM) management direction in order to establish the legal and policy framework for the BLM response to the Draft License Application (DLA). BLM resource management plans provide the framework against which the BLM will determine whether proposed operation of the Klamath Hydroelectric Project (Project) will accommodate the achievement of BLM purposes, goals, and objectives. PacifiCorp's Project is located in portions of three BLM area offices. The Klamath Falls Resource Area and the Ashland Resource Area administer lands north of the Oregon-California border. The Redding Field Office administers lands south of the Oregon-California border.

Federal Power Act

The *Federal Power Act* (FPA) of 1920, as amended, authorizes BLM to set conditions on hydropower licenses issued by FERC for the protection and utilization of reservations BLM administers. Approximately 60% of BLM-administered lands in the Project area are O&C lands managed according to the *Oregon and California Act* (1948). The remaining lands in the Project area are managed for multiple resource uses under the authority of the *Federal Land Policy and Management Act* (FLPMA) of 1976.

Land and Resource Management Plans

The FLPMA requires the BLM to develop resource management plans with public input. These resource management plans direct BLM management, including among other actions, evaluation of the DLA. BLM management direction for lands affected by the Project is contained within three comprehensive plans that have been submitted to FERC for consideration in PacifiCorp's relicensing proceedings. For a detailed review of these plans, refer to:

- *Klamath Falls Resource Area Record of Decision and Resource Management Plan*. Lakeview District. 1995. Appendix A.
- *Redding Resource Management Plan and Record of Decision*. Redding Field Office. 1993. Appendix B.
- *Medford District Record of Decision and Resource Management Plan*. Medford District. 1995. Appendix C.

Although not included as a separate appendix herein, the BLM also submitted the April 2003 *Draft Upper Klamath River Management Plan Environmental Impact Statement and Resource Management Plan Amendments* for FERC's consideration in the Klamath relicensing proceedings. The Draft Upper Klamath River Management Plan outlines management options and environmental consequences for managing lands administered by the BLM along the upper Klamath River system, including those lands within the federally designated Wild and Scenic River segment, and therefore provide important

background when considering BLM comments on the DLA. Once final, the Draft River Management Plan is intended to amend both the Redding Field Office and the Klamath Falls Resource Area resource management plans.

Northwest Forest Plan, Land Use Allocations, and Aquatic Conservation Strategy Standards and Guidelines

The Klamath Falls Resource Area, Redding Field Office, and Medford District are located within the implementation range of the Northwest Forest Plan. The 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (ROD) amended the Redding Field Office's Resource Management Plan to include new land allocations. The Klamath Falls Resource Area and Medford District plans were completed after the ROD was issued, and therefore incorporate direction from the Northwest Forest Plan. Non-Federal hydropower projects within the range of the Northwest Forest Plan are subject to the ROD, as well as the *Record of Decision for Amendment to the Survey and Manage, Protection Buffer, and Other Mitigating Measures and Standards and Guidelines* (S/M ROD).

Aquatic Conservation Strategy Objectives

Central to the Northwest Forest Plan is the Aquatic Conservation Strategy (ACS), which seeks to prevent further degradation and restore habitat condition and system health of aquatic ecosystems on public lands. The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them. Nine objectives are central to the ACS. Because the Project potentially affects watershed processes and features at many spatial scales, it is necessary to closely consider these objectives:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.
2. Maintain and restore spatial and temporal connectivity with and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configuration.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
6. Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
9. Maintain and restore habitat to support well-distributed populations of native plants and invertebrate and vertebrate riparian-dependent species.

The Standards and Guidelines (S&Gs) developed to ensure that management actions are implemented consistent with the ACS and include several relating to hydropower relicensing.¹

LH-1 requires identification of “in-stream flows needed to maintain riparian resources, channel conditions, and fish passage” and applies to new and/or existing hydropower projects.

LH-2 distinguishes between relicensing projects in Tier 1 Key Watersheds² and relicensing in other watersheds and whether a project is a new proposal or involves relicensing of an existing project. The specific S&Gs for existing projects in Tier 1 Key Watersheds require license conditions “...that require flow and habitat conditions that maintain or restore riparian resources and channel integrity.” The S&Gs for existing projects in all other watersheds require license conditions that “...emphasize in-stream flows and habitat conditions that maintain or restore riparian resources and channel integrity.”

¹ *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*, page C-36.

² An important component of the ACS is designation and management of Key Watersheds. This designation overlays all land allocations. Tier 1 watersheds are designated for sensitive fish stocks or poor watershed condition, and are a priority for watershed restoration. Two Tier 1 Key Watersheds occur in the Project vicinity: Jenny Creek (including Spring Creek) and Spencer Creek.

LH-3 addresses impacts for projects located within riparian reserves.³ LH-3 refers to existing facilities within riparian reserves “that are essential to proper management” and that require recommendations from the BLM to FERC to ensure that facility operation will be consistent with ACS objectives. If it is determined that ACS objectives cannot be met, the BLM must provide recommendations to FERC that support facility relocation. Existing facilities that must be located in riparian reserves will be located, operated, and maintained to eliminate effects that retard or prevent attainment of ACS objectives.

WR-1 addresses design and implementation of watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains ACS objectives.⁴

FW-1 addresses design and implementation of restoration and enhancement activities in a manner that contributes to meeting ACS objectives.

FW-4 identifies cooperation with Federal, Tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest, and poaching that threaten the continued existence and distribution of native fish stocks.⁵

Wild and Scenic Rivers Act and Federal Reserved Water Rights

The upper Klamath River was designated a Wild and Scenic River for its outstandingly remarkable values (ORVs), of, fisheries, recreation, scenic quality, pre-history, history, Native American traditional uses and wildlife.⁶ With the passage of the *Wild and Scenic Rivers Act* of 1964, Congress expressly reserved water for such ORVs. In 1999, the BLM filed a claim with the State of Oregon for instream flows in the upper Klamath River to protect the fisheries and recreation ORVs.

The Klamath River also includes a segment beginning at the Oregon-California border and extending to the Copco Reservoir that was determined to be eligible for “Scenic” designation in the Wild and Scenic Rivers system. Although not yet designated, Federal lands in this reach are currently managed by the BLM to maintain the ORVs that qualified for the segment for Scenic status.⁷

³ Riparian reserves include lands along streams, wetlands, and unstable or potentially unstable areas where specific S&Gs apply to most potential land uses. These areas can be described to include portions of a watershed required for maintaining hydrologic, geomorphic, and ecological processes that directly affect standing and flowing waters such as lakes, ponds, wetlands, streams, stream processes, and fish habitat. Designation of reservation reserves is intended to maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management.

⁴ *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*. WR-1 included on page C-37.

⁵ *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*. FW-1 and FW-4 included on pages C-37 and 3-38, respectively.

⁶ *Klamath Wild and Scenic River Eligibility Report and Environmental Assessment*. National Park Service, Pacific Northwest Region, August 1994.

⁷ *Redding Resource Management Plan and Record of Decision*. Redding Field Office, 1993, pages 33-39.

National Historic Preservation Act and the National Register of Historic Places

The *National Historic Preservation Act* (NHPA) of 1966 (Public Law 89-665) defines traditional use of historic resources and directs Federal agencies with responsibilities under the NHPA to maintain resources for such purposes. In the Klamath River, steelhead and salmon fishing is a traditional Tribal use. The National Register of Historic Places (NRHP) that was formalized under Section 101 of the NHPA further authorizes the Secretary of the Interior to maintain culture, defining culture to include traditions, beliefs, practices, lifeways, arts, and crafts. As an agency with responsibilities under the NHPA and Tribal trust responsibilities the BLM will support the assessment of prehistoric, historic, and potential fisheries of the Klamath River.

Part II: Comments on the Draft License Application

Part II addresses the sufficiency of the Draft License Application, focusing on overarching issues and concerns with the DLA and PacifiCorp's administrative process. The second section includes a discussion and comments on specific sections of the DLA.

A. Sufficiency Determination

Draft License Application and Administrative Process

The BLM understands that 18 CFR 4.51 and 18 CFR 16.8, which outline the contents of the application and consultation requirements, respectively, provide direction for development of the final license application. The BLM understands further that filing and acceptance of a draft application will not be delayed nor the draft considered deficient because studies or information gather is incomplete. This stated, the BLM believes that the contents of the DLA as submitted and PacifiCorp's attention to consultation requirements are insufficient and fail to meet the intent of 18 CFR 4.51 and 16.8.

In reference to 18 CFR 4.51, the BLM's primary concerns relate to the description of the Project boundary and existing conditions of the Project area, the statement of costs and financing, and the description of Project impacts that will guide development of Project protection, mitigation, and enhancement features (PM&Es). The BLM believes these sections lack the detail necessary to adequately evaluate the impact of the Project, and that Exhibit E does not contain information "commensurate with the scope of the proposed Project." In reference to 18 CFR 16.8, the BLM's concerns relate to first stage consultation and PacifiCorp's documentation of agency consultation, and whether the consultation record reflects disagreements over PacifiCorp's study plans. We are also concerned about the completeness of the second stage consultation and whether all reasonable and necessary information requested by the resource agencies has been assembled or disagreements have been documented. The second stage consultation has not provided study results, identified the proposed project operations, resource impacts or proposed protection, mitigation and enhancement measures.

18 CFR 4.51

18 CFR 4.51(b) (6) requires a description of the Project that includes the legal subdivision and tabulation of the total acreage of all lands of the United States within the project boundary.

18 CFR 4.51(e)(2) and (3) require statements of cost and financing that contain information pertinent to the fair value of the Project and proposals for new development.

18 CFR 4.51(f) requires the development of an Environmental Report, the detail of which is commensurate with the scope of the proposed Project, in order that an adequate discussion of impacts can be developed.

18 CFR 16.8

18 CFR 16.8(b) (1) (iv) requires identification of the affected environment, the presence of significant resources, and PacifiCorp's proposed environmental protection, mitigation, and enhancement measures.

18 CFR 16.8(b) (5) provides for resolution of disputes between the potential applicant and resource agencies and Indian Tribes over matters that arise during first stage consultation. Disputes may be referred to the Director of the Office of Hydropower Licensing. However, if a dispute is never submitted to the Office of Hydropower Licensing and the potential applicant fails to provide the information

necessary to resolve the point of issue, the potential applicant must fully explain the basis for its disagreement with the agency or Indian Tribe in its application.

18 CFR 16.8(c)(4)(i)(B) and (c)(4)(ii) require a draft application that responds to any comments and recommendations made by any resource agency or Indian Tribe either during or at the end of first stage consultation and that includes the results of all studies and information gathering either requested by the resource agency or Indian Tribe during first stage consultation or which pertains to resources of interest to that agency or Indian Tribe, including a discussion of proposed protection, mitigation, and enhancement measures.

An outstanding issue concerning the Project boundary has carried beyond first stage consultation and may have contributed to insufficiencies in the DLA's discussion of project impacts. Furthermore, because it remains unclear where the final Project boundary will be, and consequently how much of the Project is located on BLM-administered lands, the extent of BLM's 4(e) authority is unclear. The BLM believes that the agency's 4(e) authority applies to all BLM-administered lands impacted by the Project.

The DLA acknowledges that PacifiCorp did not complete a number of technical studies. As a result the discussion of Project impacts is incomplete. The BLM is concerned about the limited scope of studies and with PacifiCorp not finalizing their analysis. The BLM's concern relates to the importance of this information for developing recommended and mandatory conditions. Agency mandatory and recommended conditions should be supported by a substantial administrative record that includes, among other details, the results of technical analyses. The DLA fails to present study results, analysis, or a discussion of information that is forthcoming, which are necessary to complete the administrative record. Consequently, the BLM will take a conservative approach to developing PM&Es and mandatory conditions in order to ensure that BLM management goals and objectives continue to be met.

Finally, PacifiCorp's consultation record is complete in its chronology of process. However, the consultation record is discussed within the context of the Klamath Collaborative Process (See discussion on page 11). The BLM believes the final consultation record will also include, among other details, the DLA and PacifiCorp's response to stakeholder's comments. Because the DLA does not fully respond to BLM comments submitted during first stage consultation, the agency believes the history is incomplete. While BLM comments and recommendations are reiterated in Appendix B and Appendix E-1A, PacifiCorp has been inconsistent in their response to recommendations and incomplete in their discussion of how or whether the BLM's recommendations will be incorporated into the final application. The BLM does not believe that "comment noted" meets the intent of 18 CFR 16.8(c) (4). The discussion of the Klamath Collaborative Process is not a substitute for a complete consultation record.

Analysis of a Full Range of Alternatives

The BLM understands that FERC, in analyzing the proposed final license in accordance with the *National Environmental Policy Act* (NEPA), must develop an Environmental Impact Statement (EIS) that analyzes a full range of alternatives, including no-action to issuance of a non-power license or project retirement.⁸ The Environmental Report (Exhibit E) should contain information adequate to analyze a full range of alternatives. However, because many of the technical studies are incomplete, results are lacking in detail, or qualitative references are used to describe impacts of project operations, the DLA does not provide sufficient information necessary for FERC to prepare an EIS.

⁸ "The traditional license application contains an Exhibit E. Exhibit E should contain sufficient information to allow the Commission to prepare an EA or EIS." See pages 2-3 in *Hydroelectric Project Licensing Handbook, Federal Energy Regulatory Commission*. Washington, D.C. April 2001.

Klamath Collaborative Process

The Klamath Collaborative Process was convened to develop, conduct, and evaluate studies in order to establish a complete technical and scientific record necessary for developing the DLA, terms and conditions, PM&Es, and agency and Tribal recommendations and prescriptions. The work of the Collaborative over the last two years has emphasized study development, and although the Collaborative has worked through many issues, the BLM believes the Collaborative is at a critical juncture and that the group's future direction should be refocused. The BLM agrees that it is important for the Collaborative to continue to work together in order to meet the goal of developing final license articles by March 2004. However, the BLM proposes that in order to accomplish this over the next several months, the Collaborative will have to adhere to strict timelines. The BLM believes the proposed shift is manageable, and in fact, because the Collaborative Process includes provisions to revise protocols based on the particular needs of various phases, should be feasible.

The BLM would like to suggest a road map for the future that focuses on the analysis of existing data, model outputs, and existing scientific literature in order that Project impacts and necessary and sufficient mitigations for project impacts can be adequately defined. The Collaborative's current path that emphasizes study design, has guided several well-supported studies. Unfortunately, the Collaborative has yielded little in terms of a commitment by PacifiCorp to develop several studies, among them the aquatics and fisheries studies that the BLM believes are reasonable and necessary. Without these studies there is a lack of basic information that is fundamental to the evaluation of Project impacts, thus BLM will be required to mandate conservative conditions which protect the resources. Looking toward the future, the BLM suggests that the work groups shift their focus to Phase 3: Review Study Results and Interpret Data. Because PacifiCorp implemented many of the technical studies without the approval of the Collaborative the information necessary to move forward through analysis is available now. In light of this, the BLM will continue to contribute to discussions of the Collaborative as they move the current process toward negotiated proceedings (e.g., development of negotiated license articles). However, the BLM is concerned that the level of detail of analysis will vary by resource using the System Landscape Options Matrix (SLOM). The lack of studies will cause some resources to be underrepresented and at a disadvantage. Therefore, the alternative analysis (SLOM) will not be comparable by resource.

Part III: Specific Comments on the Draft License Application

1. Initial Statement

In general, the Initial Statement meets the requirements of Title 18 CFR Chapter 1, Section 4.51(a) (1-6). However, the BLM requests that PacifiCorp consider several changes, including the length of the license, the discussion of water rights, the description of Keno Dam, and the tabulation of Federal land within the project boundary. The justification for the BLM's request follows.

Length of the License

The BLM recommends that FERC consider a 30 year license length, because initial construction investment has already occurred and PacifiCorp has proposed maintaining the current facilities and operations incurring relatively modest cost. Thus, the cost to the licensee does not justify a lengthy license.

Water Rights

The water rights discussion lacks a description of how PacifiCorp's current Oregon water rights relate to the claims under the Klamath Basin Adjudication. The DLA lacks a discussion detailing the different type and status of PacifiCorp's water rights. This would include a discussion of the Oregon statutes for hydropower water rights. Also a discussion of the Spring Creek diversion should be included detailing the possible impacts to the Jenny Creek fisheries. Fisheries resources are of concern in Jenny Creek, and any reduction in flow to Jenny Creek as a consequence of Spring Creek diversions could result in a corresponding increase in water temperature that could be critical to fish. PacifiCorp should analyze the effects that diversion of Spring Creek flows from Jenny Creek could have on fisheries and include this analysis and results in the final license application.

Keno Reservoir

The description of Keno Reservoir as a re-regulating facility is inconsistent with the definition of how a re-regulating facility operates.⁹ In fact, the discussion of how the Keno Development is operated to maintain elevations in Keno Reservoir when the U.S. Bureau of Reclamation (USBR) is diverting water to the Klamath Irrigation Project is inconsistent with the definition provided in Volume I of the DLA. The description of Keno Development operations needs to change throughout the document to accurately convey actual management of that facility.

Federal Lands

The BLM has been working with PacifiCorp since January 2003 to ensure that BLM calculations of Federal land acreage within the Project boundary match PacifiCorp's calculations. Disagreement over the amount of Federal lands within the Project boundary remains an outstanding issue and the BLM will continue to work with PacifiCorp to reconcile this discrepancy. It should also be noted that the statement "no other United States lands [in addition to those within the Project boundary] are affected by the Project" is not accurate. Project facilities and operations affect resource values on federally-managed land outside of the project boundary (e.g., noxious weed dispersal, habitat fragmentation, riparian alteration, access to federally managed lands, etc.).

⁹ A re-regulating facility is a water storage and release facility which typically maintains a constant outflow, irrespective of varying inflows, allowing upstream facilities to operate as peaking facilities.

2. Executive Summary

The Executive Summary does not focus on the Project and its environment. The information presented does not detail the affected environment, the significant resources present, the project impacts, or proposed PM&Es. For some resources, the Executive Summary offers summary conclusions regarding the affected environment and project impacts; BLM comments on these topics are contained in the response to the relevant portions of Exhibit E and the Draft Technical Reports rather than the response to the Executive Summary.

The Executive Summary does not adequately characterize the status of study development and implementation. Most of the studies that have been agreed upon by the Collaborative have not been completed, and it is uncertain as to whether they will be completed in time for use in developing the final license application. Additionally, there are several studies for which there remain unresolved issues, and it is the BLM's opinion that these studies address the most critical resource concerns (e.g., fish passage, fisheries assessment, instream flows, and socioeconomics analyses). Whether these studies will be completed prior to filing of the final license application also remains a question.

Project facilities and operations are characterized in the Executive Summary (page 8-1) as being consistent with agency resource management plans. BLM believes that although the Resource Management Plans for Klamath Falls, Redding and Medford were developed with the understanding that PacifiCorp's hydroelectric Project already existed, this does not mean that the facilities and impact of their operation are consistent with the goals, objectives and direction in those plans. BLM management direction is to "maintain and restore" aquatic/riparian ecosystems and water quality (as described in the Northwest Forest Plan ACS), "protect and enhance" ORVs designated for the Upper Klamath Wild and Scenic River (provided for in the Wild and Scenic Rivers Act), and rehabilitate existing projects (BLM Manual 8400—Visual Resource Management).

The conclusion of the Executive Summary describes PacifiCorp's rationale for not documenting project impacts or proposing any PM&Es. While the BLM believes it likely that the Collaborative will continue to work toward agreement on study design and completion so impacts can be described in PM&Es developed, the BLM believes that there are alternatives for moving forward that are not included in the Executive Summary. The BLM's comments on the Klamath Collaborative Process in Part I include an example of one such alternative. This would be to focus Collaborative discussion on impacts analysis and development of PM&E measures.

Finally, given that some important studies have not been initiated, or were initiated but will Recognizing that although many studies were not completed, the BLM expected PacifiCorp to continue to move forward with analysis of available information in order to identify (if not quantify) project impacts. This has not happened. Furthermore, given that some impacts were identified, the DLA should have developed potential PM&Es stated in terms of objectives (i.e., fish passage to areas upstream of the Project) and presented as a range of options for stakeholder consideration (i.e., fish ladders, trap and haul, dam decommissioning). Again, this has not been the case. The DLA did not describe these or other potential PM&Es for many resources and thus we do not believe it meets the intent of the CFR.

probably not be completed prior to submission of the final license application, study completion could have been included among potential PM&E measures. For example, PacifiCorp's decision not to study dam decommissioning has resulted in a lack of information necessary for the Collaborative to determine whether various management objectives can be met and for FERC to analyze a full range of alternatives in their NEPA analysis. PacifiCorp should provide FERC the information necessary to analyze a full range of alternatives and provide the Collaborative the information necessary to evaluate whether the management objectives in their comprehensive plans can be met over the term of the new license.

3. Exhibit A: Project Description

In general, this section meets the requirements of 18 CFR Chapter 1, Section 4.51(b) (1-6). As previously discussed, the BLM will continue to work with PacifiCorp to resolve the discrepancy over Federal lands within the Project boundary. The two references missing from this section are the specifications of any additional mechanical, electrical, and transmission equipment appurtenant to the Project and any proposed minor modifications.

Modifications and repairs to the J.C. Boyle Dam, powerhouse, and intake that are included in Exhibit C were not included in the Project description. The modifications were implemented to prevent recurring overflow of the canal. The description of the overflow spillway on A-5-1 fails to mention the approximately 200-foot elevation difference between the end of the concrete-lined chute and the river. Overflows onto steep, unprotected slopes have created and continue to enlarge a large erosional figure that has to be evaluated for protection and rehabilitation. While the modifications to the J.C. Boyle Dam may not be determined through the relicensing process, they are features of the Project and must be included in the DLA.

The Spring Creek Diversion should be included as part of the proposed Project or should be the subject of a specific re-opener that can be applied subsequent to resolution of pending water rights claims.

4. Exhibit B: Project Operations and Resource Utilization

In general, many sections of 18 CFR 4.51(c) are missing. Specifically, sections 18 CFR 4.51(c)(2)(i) and (v), which include estimates of dependable capacity and average annual energy production; lack information on period of critical stream flow; average annual energy production; power plant capacity versus head; and minimum, maximum, and normal heads.

This section includes a lengthy discussion of the USBR irrigation project and lacks similar detail for the Klamath Hydroelectric Project. The BLM believes the DLA should limit discussion of project works maintained and operated by USBR, unless the Project proposes to alter or modify these operations. The DLA describes the Project as providing flood control and should include a more complete description of water type years when flooding occurs, the areas that are managed to reduce flooding, and how much flood storage is provided by the Project.

5. Exhibit C: Construction History and Proposed Construction

In general, this section meets the requirements of 18 CFR 4.51(d) (1-2). However, the Spring Creek out-of-basin transfer needs to be analyzed in this relicensing process or the final license application must include a re-opener requiring an effects analysis if PacifiCorp is granted their claim (Number 218).

6. Exhibit D: Statement of Costs and Financing

The statement of cost and financing is generally deficient. Most of 18 CFR 4.51(2) (e) is missing. The lack of detail precludes constructive review or comment that will apparently now have to occur after the final license application is issued.

Section 7.0: Consequences of License Denial, does not include a discussion of the new cogeneration facility in Klamath Falls and lacks reference to other proposals for energy development and production in the area including the City of Klamath's proposed co-generation plant the United Power Corporation Application for Preliminary Permit for the Bryant Mountain Pumped Storage Project (FERC No.

12452), Klamath County, Oregon. This information is necessary in order to develop a thorough discussion of replacement energy.

7. Exhibit E: Environmental Report

Water Use and Quality (Hydrology)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp presents limited information regarding hydrology of the project area and the Klamath River in the Initial Statement; the Executive Summary; Exhibits A, B, and E; and the Water Resources Draft Technical Report (DTR). Important components of the hydrologic analyses have not been completed, are not presented in the DLA, or are not mentioned at all. The information presented in these documents does not fully identify the environment affected; the significant resources present, or proposed PM&E measures, as required by 18 CFR 16.8. PacifiCorp's discussion of proposed uses (E-3-13) does not include a description of "status quo" operations (peaking, bypass reaches, flow regulation, etc.) as a proposed use.

Part of the PacifiCorp's rationale for not adequately analyzing Project impacts is the assertion that the Project has "comparatively little effect on the basin flow regime" (DTR-5-17). The purpose of the DLA is to document the existing environment and impacts related to the Project; the relative magnitude of various impacts to hydrologic processes in the Klamath River as a whole is not a factor in determining PacifiCorp's responsibility to document Project impacts.

Adequacy of Applicant's Information

PacifiCorp does not present adequate information to assess the hydrology of the Klamath River and the Fall Creek/Jenny Creek system. PacifiCorp likewise presents insufficient information to describe project impacts.

The discussion of Project effects on hydrology focuses on comparisons between flows out of Upper Klamath Lake and flows downstream from Iron Gate Dam. While this comparison is important, the omission of substantive discussion of hydrologic conditions in the river reaches between these points is not warranted. Project features occurring between Link River Dam and Iron Gate Dam include bypass reaches, regulating dams, and peaking facilities—clearly an in-depth discussion of project operations and hydrology for these reaches is needed. Without this information, the first objective of the hydrologic analysis outlined in the Water Resources DTR will not be met (DTR-5-1).

A major objective of hydrologic analysis is to provide "data and information as needed to support other studies that will further evaluate Project flow effects and potential modifications on other resources" (DTR-5-1). The results presented to date are not sufficient to meet this objective.

Development of a license that integrates the needs of various resources to the highest degree possible requires an assessment of overlap and conflicts between the hydrologic preferences of these resources. A description of the framework and methods to be used to develop these flows is not provided in the DLA. The BLM recommended development of such a framework in comments on the First Stage Consultation Document (FSCD). Because this framework will integrate information from many sources and involve many stakeholders, it is important for PacifiCorp to begin developing it as soon as possible to ensure adequate work group participation.

Seasonal Flow Patterns

Klamath River

The capability of the Project to affect seasonal flow patterns or peak flows is not addressed. PacifiCorp describes current agreements with USBR to illustrate lost flexibility in project operations (B-4-1), and thereby implies that the Project has no effect on seasonal flow patterns. There are three reasons why this assumption troubles us.

First, the assumption that the relationship between PacifiCorp and USBR will not change during the period of license is not reasonable. The current nature of the relationship (annual renewals of “temporary modifications” to the contract [see Appendix B-1A in Exhibit B]), the uncertainty associated with ongoing lawsuits, and the potential for structural modifications of water management infrastructure all suggest that this assumption is questionable.

Second, PacifiCorp presents conflicting and incomplete information to support the claim that seasonal flow patterns are not affected by the Project. The Water Resources DTR depicts low operational storage capacity a very limited capability of the Project to affect river flows below Iron Gate Dam (DTR-5-28 to 5-30). In contrast to this, in the same set of figures (DTR-5-30), PacifiCorp displays data to suggest that Project operations cause increased summer flows. These conclusions should be explained and rectified with other studies before accepting the assumption that the Project has no effect on seasonal flow patterns. (Similarly, a narrative should explain the results that suggest USBR Klamath Irrigation Project operations result in higher summer flows in some years, contrary to most other published literature.)

Third, PacifiCorp does not adequately describe the effects of diversions and bypass reaches in terms of reduced minimum flows. This is an obvious and direct project impact on seasonal flow regimes. Minimum flows in the bypass reaches have been reduced to a small fraction of average daily flows in upstream and/or downstream reaches.

Fall Creek/Spring Creek

The brief discussion of flows in Fall Creek (Exhibit B, 11-1 to 11-4; DTR-5-14) and depiction of estimated monthly flows (Exhibit E-3-10) is inadequate. The flow estimates provided for Fall Creek in Figure B-3.2-3 are based on assumptions; furthermore, the graph misrepresents the assumed flows by summing the minimum diversion rate and the maximum diversion rate.

The DLA makes no mention of Project impacts on the Spring Creek/Jenny Creek system. The Project diverts up to 16.5 cfs of high quality water from Spring Creek, a tributary to Jenny Creek. Seasonal flows in this system are reduced due to Project operations, especially in the summer, when Spring Creek would naturally provide a relatively large volume of water to Jenny Creek. Fisheries resources are of concern in Jenny Creek, and any reduction in flow to Jenny Creek as consequence of changes in Spring Creek flows could result in impacts to water quantity, water quality, and fisheries resources. Additional information is needed on Project impacts to this system.

Daily and Weekly Flows

A primary objective of the PacifiCorp’s hydrologic analysis is to determine the “potential effects of PacifiCorp operations on the short-term hydrologic regime” (DTR-5-1). The analysis presented in the DLA is insufficient. Project effects on the short-term (daily to weekly) flow regime are not described in sufficient detail for the Link River and Keno Reaches, and are not described at all for the other reaches. “Snapshot” summaries are not sufficient for determining Project impacts or for analyzing future operating scenarios; short-term flow modeling as described in the Water Resources DTR should be completed.

Results of short-term hydrodynamic modeling for the three primary flow operational scenarios (see DTR-5-6) are not presented in the DLA.

Link River

The description of Project effects on daily and weekly flow regimes in the Link River reach relies on depiction of a single hydrographs showing average daily flows over a three year period (DTR-5-34). The DLA summarizes minimum flows and turbine capacities but does not discuss short-term flow fluctuations.

Keno Reach

For the Keno Reach, two hydrographs are depicted. PacifiCorp describes the rapid and severe (in excess of 2000 cfs) flow fluctuations as the result of “diversions and return flows” from USBR’s Klamath Irrigation Project (DTR-5-38) and suggests that the Project has “little control [on the] varying flows that pass through Keno dam” (Exhibit E-3-11). PacifiCorp describes management of Keno Dam to maintain constant reservoir water surface levels (DTR-5-38), without noting the substantial operational flexibility that could be used to limit the rate and/or magnitude of flow fluctuations downstream from the dam:

“The 1968 contract requires PacifiCorp to maintain Keno reservoir at elevations between 4085.0 and 4086.5 feet whenever USBR is diverting water to the USBR Project. From the upper bounds to the lower bounds of these elevations is the equivalent of 18,500 acre-feet” (B-6-1).

As such, the DLA does not clearly describe the impacts of Keno Dam operations. Although estimated inflows and outflows for three water years are displayed (Figure 5.7-13 in the Water Resources DTR), no discussion or analysis describing the magnitude of Project effects on flows downstream from Keno Dam is presented (i.e., the actual effect of Keno Reservoir on river flows has not been quantified). A discussion of future flexibility for modifying flows is needed.

J.C. Boyle Bypass and Peaking Reaches, Copco II Bypass Reach, Klamath River below Iron Gate, Fall Creek, Spring Creek/Jenny Creek

The DLA presents no substantive description of short-term flow regimes and Project impacts in these reaches. Brief summaries are provided in Exhibits B and E. No explanation is provided as to why detailed information is not presented in Exhibit E or the Water Resources DTR. The Water Resources DTR notes that peaking operations can affect aquatic resources but provides no discussion of the frequency, duration, or magnitude of impacts from such operations.

Peak Flows

Past and potential future effects of Project reservoirs on peak flows are not addressed. Instead, PacifiCorp concludes that Project reservoirs do not have sufficient capacity to affect peak flows.

Alternative Information and/or Interpretation

The DLA generally lacks data, analytical results, and substantive discussion of specific Project impacts. Other sources, such as Balance Hydrologics (1996), are available, however, to provide alternative views of the affected environment and Project impacts that suggest the need for PM&E measures.

Seasonal Flows

Although “the river has always undergone extreme droughts and floods,” as stated in Exhibit E, flow modifications caused by development of the Klamath Irrigation Project and operations of the Project have resulted in river flows during some parts of the year that are substantially less than minimum flows recorded in the early part of the 20th century (Figure III-1). Balance Hydrologics (1996) found that summer low flows are much reduced from historic levels. Data from the USGS Keno gage show that minimum flows prior to development of water management infrastructure were on the order of 800 to 1000 cfs. Flow accretions between the site of the Keno gage and Iron Gate Dam are on the order of 300 cfs (DTR-5-9), suggesting that historic minimum flows were on the order to 1100 to 1300 cfs. These estimates approximate those of Hardy and Addley (2001) presented in the Water Resources DTR. It is clear that summer minimum flows, especially those in bypass reaches, are much less than would have occurred historically, even during “extreme droughts.”

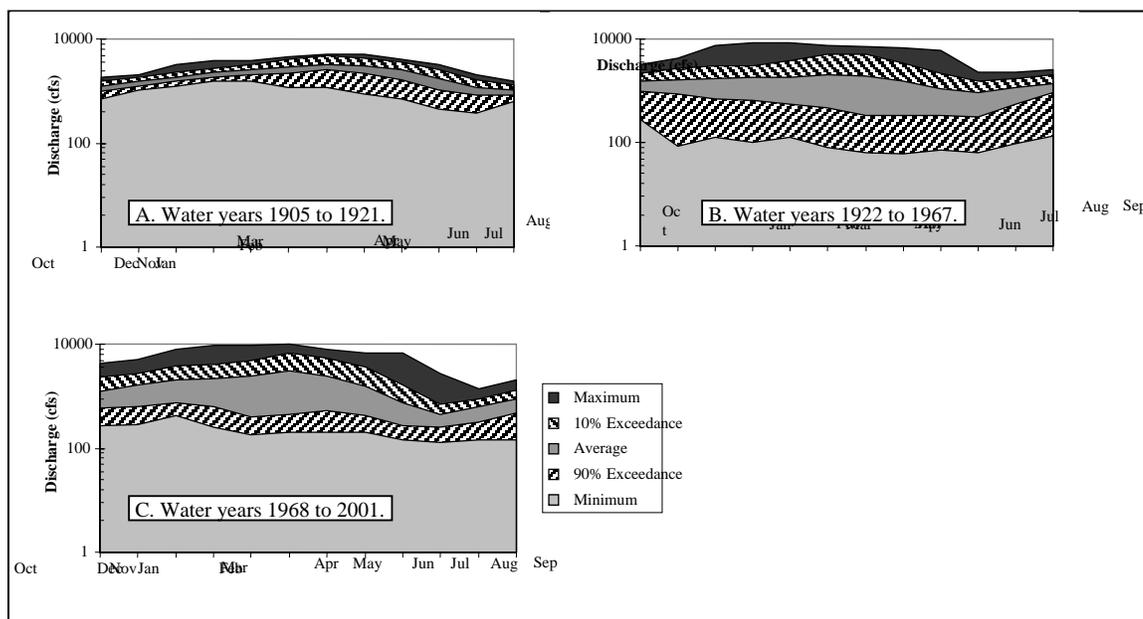


Figure III-1. Graphical representation of summary flow statistics for the Keno reach, illustrating reduced minimum flows and increased seasonal variability. Note the logarithmic scale for the y-axis (BLM 2001).

The statement in Water Resources DTR-5-8 that “gaged runoff and flow patterns on the Klamath River closely reflect climatic conditions and cycles” is misleading, because spatial and temporal nuances are not discussed. For instance, Project-related flow fluctuations bear little resemblance to natural conditions; nor do reduced flow magnitude and variability in the three mainstream bypass reaches. In addition, the volume of runoff, as well as the timing and rate of flow change below Iron Gate Dam, are strongly affected by upstream hydrologic alterations. The comparison of pre- and post-Iron Gate hydrographs presented in Ayres Associates (1999, pages 7.13 to 7.46) suggests that the Project may also be affecting seasonal flow patterns.

Continued reliance on “current” USBR/PacifiCorp agreements and practices is unrealistic (DTR-5-17). Operating frameworks currently in place are driven by judicial decisions, biological opinions, annual operations plans, and contracts, all of which could change during the next 30 to 50 years. It would be appropriate to include a discussion of this potential future flexibility and a description of how effects of modified operations would be addressed and mitigated over the life of the new license.

The DLA does not discuss the effects of the Fall Creek diversion on flows in the Spring Creek/Jenny Creek system. Diversion of between 5 and 16.5 cfs from the system during summer and fall removes a substantial proportion of flows from this system (Oregon Water Resource Department records from 1992 to 1998 indicate summer low flows of less than 10 cfs).

Daily and Weekly Flows

Daily flow regimes in the Keno and J.C. Boyle peaking reaches exhibit impacts of flow fluctuations as a consequence of Project operations. The average daily data used by PacifiCorp does not accurately characterize flows in these reaches (Figure III-2).

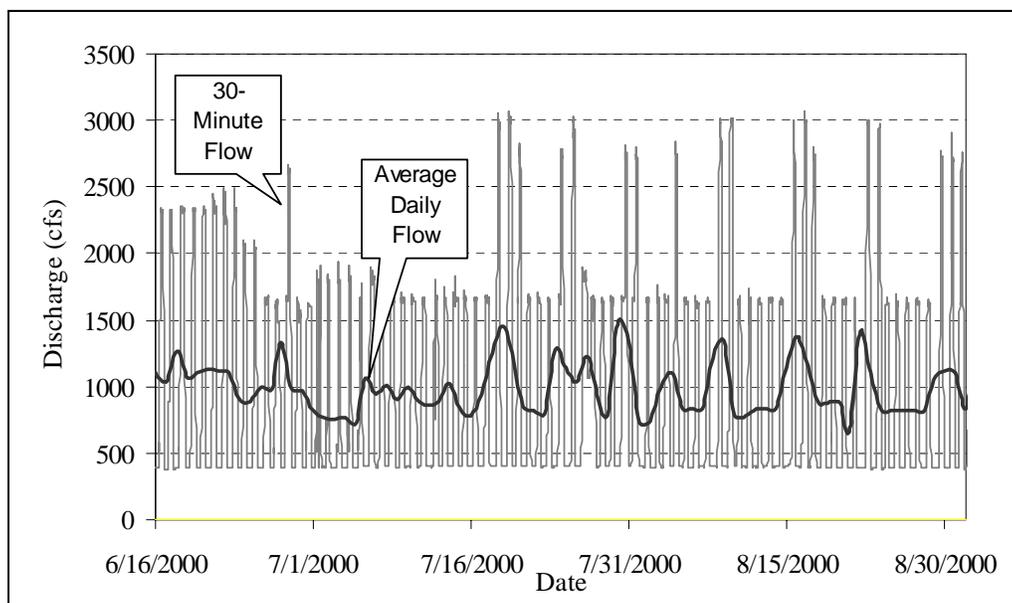


Figure III-2. Actual measured river flows in J.C. Boyle Peaking reach, compared to average daily flows (data from USGS gage 11510700).

Daily peaking operations establish the dominant hydrologic characteristic of the J.C. Boyle full flow reach, causing significant daily stage and discharge fluctuations. During low flow periods (summer/fall), there is typically only one turbine generating for a portion of any given day. During these periods, discharge below the powerhouse generally ranges from 300 to 400 cfs (baseflow, composed of outflow from the dam and contributions from springs) to approximately 1,500 cfs (baseflow plus turbine through flow). When there is sufficient water and consumer demand both turbines may be in operation (Figure III-2), and flows can ramp from baseflow to 3,000 cfs within a few hours. Alternatively, there may be days when no water is released in excess of the minimum bypass flow. Depending on how the J.C. Boyle complex is operated, discharge fluctuations within a 24-hour period can range from 50 to more than 2,500 cfs.

Peak Flows

Project reservoirs could potentially store average daily discharges up to 5,900 cfs. This value reflects the active storage capacity of Iron Gate, Copco I, and J.C. Boyle reservoirs, and assumes that all active storage capacity is available. It is unlikely that the full capacity of Project reservoirs is available for storage during floods, but some degree of storage and release may be available. Model results should be presented to document the magnitude of Project impacts of peak flows. This discussion should also describe potential reductions in the duration of peak flows caused by the Project (e.g., flow shaping and hydrograph flattening at the onset and recession of peak flows).

In the three mainstream bypass reaches, peak flows are reduced by volumes equivalent to the total capacity of the associated powerhouses (Table III-1).

Bypass Reach	Reduction in Flood Magnitude (from Exhibit B)
Link River	1450 cfs
J.C. Boyle	2850 cfs
Copco II	3200 cfs

Table III-1. Reductions in flood magnitude for Project bypass reaches on the Klamath River.

Floods with recurrence intervals of about 1.5 years are generally considered to be the most geomorphically effective (Dunne and Leopold 1978). Analysis of peak flow data from the USGS J.C. Boyle gage suggests that flows of between 3,100 and 4,700 cfs occur about every 1.5 years in the J.C. Boyle peaking reach. Spills from J.C. Boyle Dam into the J.C. Boyle bypass reach occur in about 2 out of every 3 years. Due to flow regulation and diversions, peak flows in the J.C. Boyle bypass reach are currently of lower magnitude, shorter duration, and reduced frequency than would occur were the river unregulated. The same can be said for peak flows in the Copco II Bypass reach.

Approximate Recurrence Interval (years)	Peak Flow in J.C. Boyle Peaking Reach (cfs)	Peak Flow in J.C. Boyle Bypass Reach (cfs)
1.5	3,320	470
2.3	6,320	3,470
10.5	10,600	7,750

Table III-2. Reductions in flood magnitude in the J.C. Boyle Bypass reach (based on recurrence interval calculations for all peak flows greater than 2,760 cfs recorded at USGS gage 11510700).

BLM's Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

The discussion of hydrologic conditions affected by the Project is insufficient. Neither the existing environment nor Project impacts are fully described. Specific information regarding Project operations is lacking. Important discussions regarding peaking operation, bypass reaches, and the trans-basin diversion of water from Spring Creek/Jenny Creek to Fall Creek is absent. Substantial elements of the hydrologic analysis have not been completed. This information is important to fully assess Project impacts on fisheries, aquatic habitat, water quality, riparian vegetation, and recreation.

Proposed flow-related PM&E measures are described in the Fisheries/Aquatic Habitat, Water Quality, Geomorphology, Riparian, and Recreation sections of this document.

Water Use and Quality (Water Quality)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

The discussion and analysis of water quality is incomplete. The data and discussion presented in the DLA is not adequate to describe conditions in the area affected by the Project or to quantify Project impacts. No proposed PM&E measures are presented.

Adequacy of Applicant's Information

Overall, there is no substantive discussion of Project impacts. For many water quality constituents, the water quality discussion seems to focus more on upstream/downstream comparisons that do not yield information on the effects of Project facilities and are not adequate for assessing the three main scenarios that PacifiCorp agreed to assess in their letter to the Stakeholders February, 2002. The discussion of existing data in Exhibit E focuses on effects unrelated to the Project. The context provided by these discussions is important, but does not substitute for a thorough discussion of Project impacts. The utility of the data presented in many of the figures is diminished by "grouping" of data points in a way that ignores seasonal processes or spatial patterns.

Discussion of the impacts related to the diversion of high quality spring water from the Spring Creek/Jenny Creek system into Fall Creek is completely omitted from the DLA.

Temperature

The discussion of water temperature in the DLA focuses on average daily temperatures (DTR-3-18). This metric does not adequately describe conditions or impacts in the peaking reach, which experiences large daily temperature fluctuations. The DLA mentions the daily fluctuations of up to 12 C (DTR-3-16) but does not adequately explore the relationship between peaking operations and water temperature. The initial water temperature modeling results presented in the DTR provide a useful starting point for discussions of Project impacts.

Other Water Quality Parameters

The descriptive analysis presented in the DLA does not adequately represent the complex water quality dynamics in the river and reservoirs. The water quality modeling is incomplete, but once final should yield an enhanced understanding of the system.

Numerous aspects of potential Project effects on water quality are mentioned in the text or discerned from the figures but are not elaborated on. For instance:

- DO appears to be lower at sites below J.C. Boyle, Copco, and Iron Gate Dams than at the next closest upstream river site, suggesting DO reductions as a result of water quality processes within Project reservoirs (Figure 3.7-9);
- Concentrations of chlorophyll-a appear to be higher below reservoirs than above (except for J.C. Boyle) (Figure 3.7-22), reflecting the presence of *Aphanizomenon* populations in Project reservoirs (DTR-3-47); and,
- The Water Resources DTR (page 3-49) suggests that phosphorous (P) and nitrogen (N) are released from sediments due to anoxic conditions in the hypolimnion of Project reservoirs. A hypothesis presented on page 3-54 regarding the stability of the hypolimnion in Copco and Iron Gate reservoirs and subsequent seasonal sequestering of P and N needs more exploration.

The lack of multiparameter sites in the upstream portion of the J.C. Boyle Peaking reach precludes analysis of water quality trends in this reach or comparisons of nutrient processing between this and other reaches. More information is also needed to describe the abundance and role of attached algae and macrophytes that may effect of water quality dynamics (DTR-3-49) and can be affected by Project operations (such as peaking or reductions in streamflow).

Water Quality Modeling

The results of the water quality modeling effort for parameters besides water temperature are not presented, even though “the modeling framework is substantially complete” (DTR-4-58). There is no discussion of DO for any reach, even though the model has been calibrated and validated for DO in the Link River, Keno, J.C. Boyle Bypass, and J.C. Boyle Peaking reaches. These results will be critical to the discussion of Project impacts; without these results, Project impacts cannot be fully understood.

Alternative Information and/or Interpretation

Additional information regarding water quality can be derived from previous research in the Klamath River and BLM temperature monitoring data in the Klamath River and Jenny Creek. The following is a synopsis of the available information which can be provided upon request.

Temperature

The “Water Resources DTR describes a reduction in water temperature between the Oregon-California boundary and a site upstream from the mouth of Shovel Creek, based on analysis of residuals from three sampling events at the upstream site.” BLM water temperature data from 2002 appears to refute this assessment (Figure III-3). This data suggests that the three data points from the site at the Oregon-California boundary do not adequately represent the Klamath River water temperature regime. The BLM data from 2002 is available upon request.

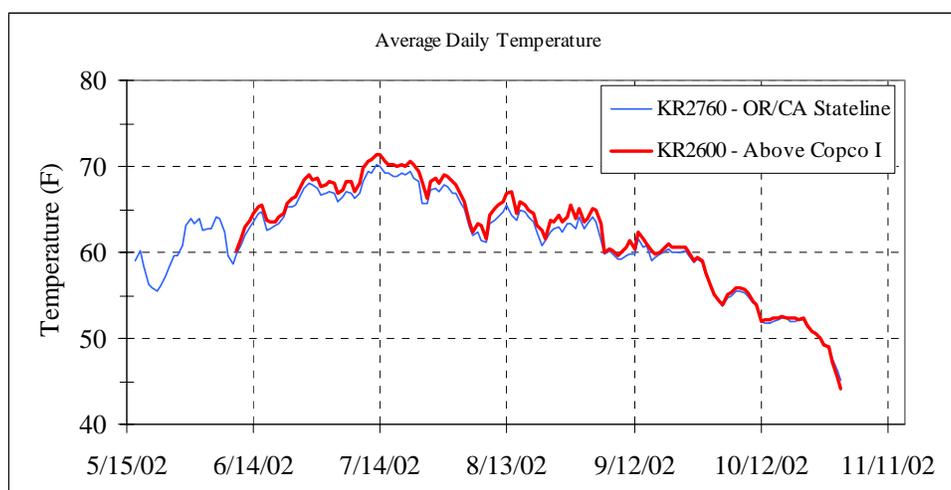


Figure III-3. Average daily water temperatures in the Klamath River at the OR/CA Stateline and upstream from Copco I reservoir (BLM Data).

In the discussion of assumptions used in the modeling effort, the Water Resources DTR (page 4-36) indicates that no estimates of temperature changes over the length of the J.C. Boyle canal were made. The temperature of the outfall of the canal needs to be measured prior to being incorporated in the model.

Overall, the discussion of water temperature trends in the J.C. Boyle reaches is not adequate. There is no discussion of warming rates in the bypass reach between the dam and the groundwater accretions. This stream reach provides salmonid spawning habitat and is on the State of Oregon 303(d) list for exceedances of the water temperature criteria (E-3-122).

There is no substantive discussion of daily fluctuations caused by peaking operations. These fluctuations are of greater magnitude and occur at faster rates than would occur with steady flow or no Project, and result in higher daily maximums during some parts of the year (Figure III-4). Furthermore, there is no

discussion in the DLA of the temperature gradient that occurs where flows from the J.C. Boyle powerhouse meet flows from the bypass reach. Impacts of Project operations on water temperatures in these reaches vary through the year, and should be described in greater detail.

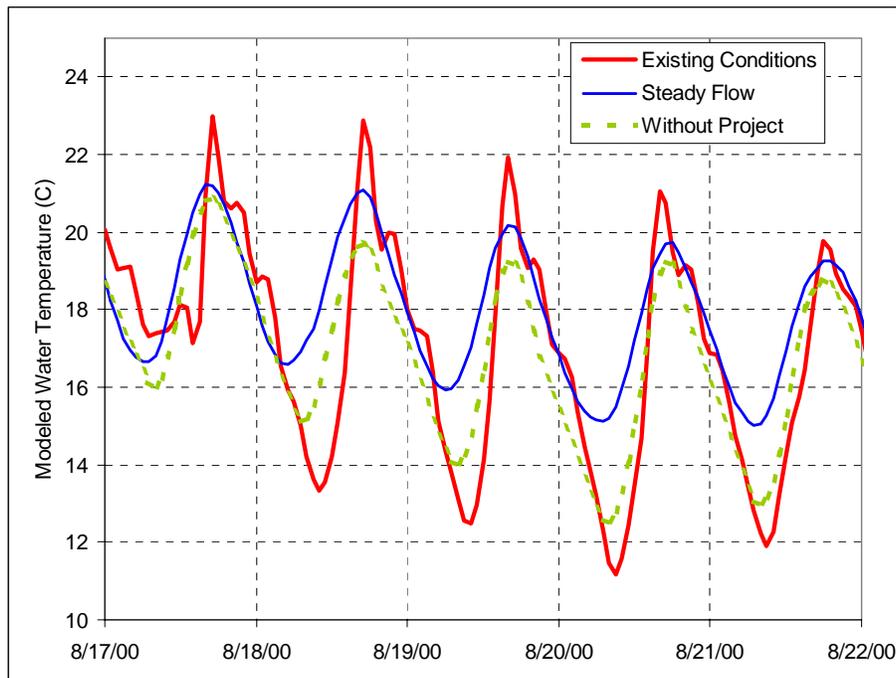


Figure III-4. Modeled water temperatures in the Klamath River at the OR/CA Stateline summarized from applications of the water quality model to various scenarios.

Diverting a substantial proportion of the flow from Spring Creek into Fall Creek could have detrimental effects on water quality in Jenny Creek. We did not see a discussion of potential impacts of these operations in the DLA. Spring Creek is the only major perennial tributary in the lower third of Jenny Creek and is a crucial source of cool water for the stream. The average of the seven day running average of maximum daily temperatures is always cooler in Jenny Creek below Spring Creek - even with the diversion - than it is above (Table III-3). Project impacts on this important source of cold water should be explored.

Table III-3. 7-day average maximum temperature (from Cascade-Siskiyou National Monument Draft RMP/EIS, Appendix U)

	1992	1995	1996	1997	1998	1999	2000
Jenny Creek below Oregon Gulch	82.2	79.9	82.2	79.6	80.8	76.9	80.7
Jenny Creek below Spring Creek	75.7	76.9	79.3	77.0	76.7	74.0	75.7

Other Water Quality Parameters

Campbell (1999) collected nutrient data at three sites (downstream from Keno Dam, downstream from the J.C. Boyle powerhouse, and downstream from Iron Gate Dam) to test the hypothesis that the Project reservoirs acted as nutrient sinks and therefore caused reductions in nutrient loading (Campbell 1999, page 27). Campbell’s analyses rejected that hypothesis and “generally indicated that although each reservoir may in fact act as a nutrient sink when inflow to outflow loadings are compared (page 27)”, concentrations of total phosphorous, ortho-phosphorous, and nitrate tended to increase from upstream to downstream, as did phosphorous loading. Concentrations of ammonia, total Kjeldahl nitrogen, total nitrogen, and total organic nitrogen decreased between the Keno and Iron Gate sites (page 35), as did

nitrogen loading. Campbell was not able to determine whether the apparent increase in phosphorous loading was due to internal or external sources. The findings of Campbell (1999) were not discussed in the DLA; we suggest that this information be rectified with the results and conclusions presented in the DTR.

Proposed PM&E Measures

- Instream flows to support attainment of water quality objectives
- Operation of Spring Creek diversion to limit adverse impacts to water quality and fisheries in Jenny Creek

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

The Project has substantial effects on water temperature regimes in many river reaches, especially in bypass and peaking reaches. The Project has the potential to affect many other parameters as a result of reservoirs, Project operations, or maintenance activities. Project impacts are not adequately addressed in the DLA. Substantial elements of the water quality analysis have yet to be completed.

Water Use and Quality (Geomorphology)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

Linkages between the Project and geomorphic processes are of interest because of possible impacts to aquatic and riparian habitat. The information presented in Exhibit E (E-3-148 to 152) and the DTR (found in Chapter 6 of the Water Resources DTR) is incomplete. The DLA discussion of river geomorphology does not adequately characterize the existing environment and project impacts.

The cursory description of Klamath River geomorphology presented in Exhibit E (E-2-4) does not provide any information about the river downstream from Iron Gate Dam. A detailed description is important, given that Project effects on river geomorphology extend into this portion of the river. The information used to describe the river between Link River Dam and Iron Gate Dam could also be described in greater detail.

The discussion of Project impacts is substantively similar to “background” information presented in the Study Plan and does not incorporate study findings.

No PM&E measures are proposed.

Adequacy of Applicant’s Information

Existing Environment

A study of geomorphic processes affected by the Project is underway. The major elements of this study have not yet been completed. As a result, study objectives have not been met, and Project impacts are hard to quantify.

The tasks outlined in the Water Resources DTR should be finished. Beginning with the First Stage Consultation Document (FSCD), the BLM has recommended timely implementation of study plans. To date, very limited bedload and suspended sediment sampling have been conducted. As a result there are no conclusions presented in the DLA.

For various reasons (described in the reports, in the Water Resources DTR, and in BLM correspondence and notably the response to the FSCD and Second Stage Consultation Document), none of the documents described in the literature review provided in the Water Resources DTR are directly applicable to questions regarding the existing environment and potential Project impacts. The information in these documents provides context and some usable data but is not by itself adequate to meet the intent of 18 CFR 16.

The DLA discussion of the discharge required to mobilize bed material (the “threshold of bed mobility,”) and bedload transport rates is lacking. Results depicting the threshold of bed mobility are presented for 5 of the 14 study sites. The Water Resources DTR notes that the calculations for the remainder of the sites will be completed in the future, contingent upon bedload sampling or flows sufficient to move tracer gravels (which might not occur until 2004 or beyond). Given that bedload sampling was conducted at the Shovel Creek site within the J.C. Boyle peaking reach (see DTR 6-12), it is not clear why bed mobility calculations for this site were not presented (see DTR 6-73).

We could not find a discussion of suspended sediment transport in the DLA. Aside from a summary of methods no results are presented. Accurate assessments of suspended sediment transport rates should be developed. This is important for three reasons:

- The total amount of material transported as suspended load often far exceeds the amount transported as bedload (Knighton 1984; Leopold 1994), which has ramifications for development of sediment budgets.
- The initial results of the reservoir sedimentation analyses suggest that a layer of fine sediment occurs throughout Project reservoirs (DTR-6-36 to 6-40).
- Given that only about 1500 cfs is required to mobilize sand in the J.C. Boyle peaking reach (DTR-6-73), flows generated during daily peaking cycles in that reach are of sufficient magnitude to transport suspended sediment.

Suspended sediment transport should be measured at the three bedload sampling sites, as well as in the Link River, Keno, and J.C. Boyle bypass reaches. Measurements are required in these three additional reaches because the ongoing tracer gravel efforts in these reaches will not provide any suspended sediment information. Measurements should occur during various flows that adequately represent the operational range of the Project. The PacifiCorp should confer with members of the Geomorphology Working Group (GWG) through out the analysis.

The Water Resources DTR includes (in Appendix 6) bedload transport rating curves developed using three different bedload transport models, but provides no discussion of the applicability of the various models and nor model calibration. Page 6-19 of the Water Resources DTR states that “the most appropriate of the three bedload transport models will be selected based on study site characteristics...” The wide disparity in the results of the various models, model calibration, and selection should be done in concert with GWG members.

The range of flows for which bedload rating curves were developed does not extend down to the flow at the threshold of bed mobility. (For instance, sand begins moving at around 1500 cfs at the USGS gage site in the J.C. Boyle peaking reach, but the lowest flow presented on the bedload rating curve is 7700 cfs.) As a result, the DLA does not provide the information needed to assess the effects of Project-related flow fluctuations on sediment transport.

Project Impacts

The assessment of reservoir sedimentation presented in the DLA is incomplete. The primary objective of the reservoir bathymetry analysis was for water quality modeling rather than geomorphic analysis, and therefore does not provide adequate information regarding the volume and character of sediments trapped in Project reservoirs.

In addition to estimating the volume of sediments trapped in the reservoirs, it is also important to characterize the particle size of trapped sediments. Eilers and Gubala (2003) detected possible sand and silt accumulations near the tributary mouths in J.C. Boyle, Copco, and Iron Gate reservoirs. Sediment samples collected from the bottom of the reservoirs show substantial proportions of sand and silt in all Project reservoirs (DTR-6-35). Because geomorphic considerations were not the primary objective of the work done by Eilers and Gubala (2003), the information they present on grain size distributions is not adequate to describe the existing environment and determine Project impacts. A BLM hydrologist visited Iron Gate reservoir deltaic deposits in March 2003 and noted abundant sand and gravel accumulations at the mouths of Scotch and Jenny Creeks.

Completion of the surveys at tributary deltas is necessary to refine the estimates of sediment trapping and assess the effects of reduced sediment supply on fluvial processes and features in river reaches downstream from dams. Beginning with the FSCD the BLM has recommended that PacifiCorp obtain information on tributary sediment supply since the FSCD.

The sediment budget described in the Water Resources DTR will, in many ways, serve to integrate other components of the study, including reach characterization, sediment transport analyses, and assessments of reservoir sedimentation. Despite the progress made in the Geomorphology Work Group (GWG) meetings, more details of the methods and assumptions to be used in developing the sediment budget are needed. As PacifiCorp continues to implement the geomorphology study, and as field work and analysis are completed, PacifiCorp should update the work groups and provide opportunities for stakeholder input.

Protection, Mitigation, and Enhancement Measures

The DLA discusses potential Project impacts only in conceptual terms (see Exhibit E-3-148 to 3-151). Although this is understandable, given the lack of timely results from the study, the discussion of impacts does not meet the intent of 18 CFR 16. No specific Project impacts are identified or quantified. Considering the incomplete results of the reservoir sedimentation assessment, PacifiCorp is aware of sediment trapping by Project reservoirs. This impact is not documented in the DLA.

Because of the inadequate discussion of Project impacts, the DLA contains no proposed PM&E measures to address ongoing impacts. In addition, no information is presented that allows comparison of the three "high level" flow scenarios being considered for fish passage (as requested by the BLM in a letter to PacifiCorp dated 11/15/2002). Despite BLM recommendations including the FSCD and in GWG meetings, no information has been made available to facilitate development of PM&E measures.

Alternative Information and/or Interpretation

Very few data and analyses have been presented to date; thus it is difficult to present alternative interpretation of material within the DLA.

Reservoir Sediment Trapping

From the information available, it appears that there is a high likelihood that Project dams prevent substantial volume of sediment from moving downstream. Although the bathymetry analysis presented in Eilers and Gubala (2003) and summarized in the Water Resources DTR leaves many important questions unanswered, it does provide useful insight. From a geomorphic perspective, perhaps the most important elements of the report are the reductions in reservoir volume over time, which can be attributed to sediment trapping in reservoirs (Table III-4, summarized from pages 36 and 37 of Eilers and Gubala [2003]).

Reservoir	Estimated Loss of Volume (cubic feet)
Keno	3,900,000
J.C. Boyle	600,000
Copco	260,000,000
Iron Gate	130,000,000
Total	394,500,000

Table III-4. Reductions in reservoir volume estimated by comparing current bathymetry with pre-Project maps.

The Water Resources DTR noted that the largest volume change, measured in Copco Reservoir, “appears realistic considering that this is the oldest impoundment in the system, it is deep with a high trapping efficiency, and is situated in a portion of the study area with considerable topographic relief” (page 6-41).

The estimates of volume change likely underestimate sediment trapping. As described in Eilers and Gubala (2003), the pre-Project volume did not include the volume of the river channel itself. More importantly, PacifiCorp did collect high resolution bathymetry data at the mouths of tributaries during the initial bathymetric survey conducted in 2001. The area of J.C. Boyle near the mouth of Spencer Creek, a stream that drains a watershed of approximately 80 square miles, was not surveyed at all in 2001.

Sediment Transport

Flow fluctuations caused by the Project are capable of mobilizing suspended load. This assumption is based on the relatively low flows required to mobilize sand (see Table III-5). It is likely that Project-related flow fluctuations can also entrain sand and small gravel. Bedload transport initiated by Project-related flow fluctuations is especially likely to occur in reaches that have more sediment available than the river in general. Such reaches occur downstream from tributaries (such as Shovel Creek) or other sediment sources (such as the scour hole caused by the J.C. Boyle emergency spillway).

	Gradient	D ₅₀	Sand	Gravel	Cobble
Link River	0.013	53 mm	478 cfs	712 cfs	941 cfs
Keno	0.006	336	1247	4870	11141
J.C Boyle Peaking at USGS Gage	0.003	101	1490	6330	12900
Copco II Bypass	0.008	176	340	1494	3048
Tree of Heaven Campground	0.001	42	506	2272	4331

Table III-5. Bed mobility calculations prepared by PacifiCorp (DTR 6-73 and DTR Appendix 6B).

The combination of reduced sediment supply (due to the dams) and increased transport of suspended load and bedload has likely resulted in altered substrate conditions in some river reaches. The two reaches

most likely to have been affected are the J.C. Boyle peaking reach and the river reach downstream from Iron Gate Dam.

The duration of flows capable of transporting fine sediment and small gravel has increased in the J.C. Boyle peaking reach due to peaking operations (refer to the BLM interpretation of hydrologic data, above). This reach is steep and structurally constrained (by bedrock and large boulders), and therefore may not respond dramatically to altered flow and sediment regimes. The stability of gross geomorphic features does not imply that the Project has no impacts. Textural change of bed material due to reduced sediment supply and increased sediment transport is likely. The occurrence of silt, sand, and gravel within the channel has likely decreased. The proportion of bed material comprised of these size classes may have been relatively minor to begin with in some portions of this reach. However, lower gradient sections (such as near RM 217) may be more susceptible to Project impacts that impair sediment deposition.

The cumulative effect of sediment trapping by Project reservoirs is greatest in the river reach downstream of Iron Gate Dam. California Department of Water Resources (1981) prepared a report describing substrate characteristics in this reach. Bulk samples collected for the CDWR analysis suggest that some degree of bed armoring is occurring (Figure III-5). The extent to which processes of selective transport of bed material which commonly occurs in systems with heterogeneous substrate, or reduction in sediment supply, due to the dams are causing bed armoring is not clear. It is certain, however, that a substantial volume of silt, sand, and gravel has been captured by Project reservoirs.

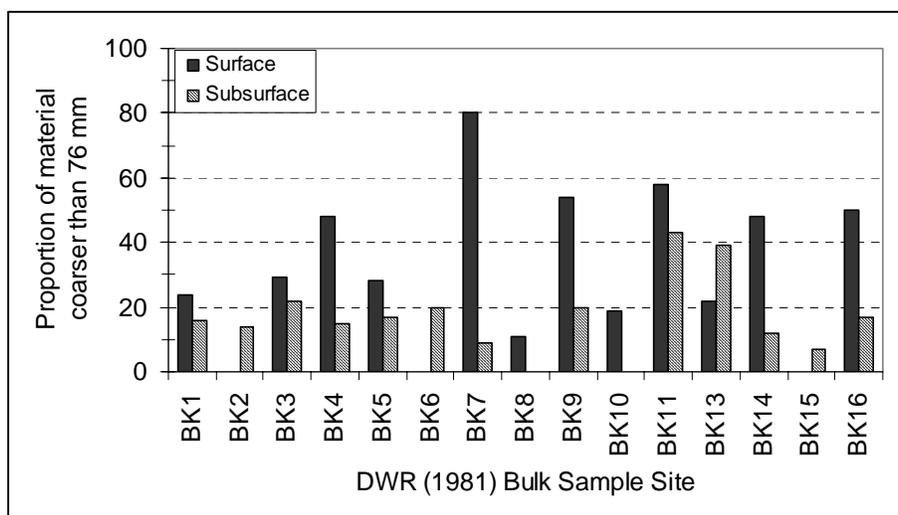


Figure III-5. Summary of bulk sampling data collected by California DWR (1981).

PacifiCorp should consider conducting bulk sampling and installing additional tracer gravels in order to assess Project impacts in the reach below Iron Gate Dam.

Bypass Reaches

In addition to the system-wide effects of sediment trapping and altered sediment regimes, PacifiCorp must consider impacts to geomorphic processes and landforms in Project bypass reaches. In the J.C. Boyle Bypass reach, the channel has been constrained by sidecast from the construction of the bypass canal (Figure III-6).



Figure III-6. Sidecast from the bypass canal reduces channel complexity during high flows and impairs riparian vegetation.

Although PacifiCorp notes that the sidecast extends across the channel at only one point (DTR-6-46), the sidecast encroaches into the active channel for much of its length (about 1.5 miles). The rubble from the sidecast effectively functions like rip-rap and alters channel processes of bank erosion, sediment deposition, and interaction with riparian vegetation.

In both of the Project bypass reaches on the mainstem, the magnitude of flooding has been reduced by approximately 3000 cfs and the duration of floods has been reduced. At the same time, delivery of sediment to these reaches has also been reduced. The likely results of these changes include reduced channel area, reduced channel width, and textural changes in bed material. Encroachment of reed canary grass and other vegetation may also be causing increased deposition of suspended material.

Impacts to Other Resources

Changes in geomorphic processes also affect aquatic habitat, riparian vegetation, wildlife habitat, and cultural resources and the DLA fails to adequately discuss the interrelationship of these resources.

Potential PM&E Measures

- Complete the Analysis of Project Effects on Sediment Transport and River Geomorphology in a timely manner. Continue to coordinate with the GWG. Review comments on the DLA and incorporate revisions needed to ensure that the existing environment and Project impacts are adequately documented.
- In coordination with members of the Geomorphology and Aquatics work groups, develop a Coarse Sediment Augmentation Plan (CSAP). The objective of the CSAP would be to restore the volume and character of sediment moving through river reaches in order to facilitate restoration of aquatic habitat and riparian areas. Major elements of the CSAP will include locations of augmentation sites, schedules for the timing and rate of sediment augmentation at each site, timelines for the number of years sediment augmentation is

required, procedures for the acquisition of suitable sediment (size ranges and proportion of fine material), measures to be taken to minimize adverse impacts to water quality, practices needed to minimize the introduction of noxious weeds, and monitoring. Likely sites for sediment augmentation include downstream from J.C. Boyle Dam, downstream from J.C. Boyle Powerhouse, and/or downstream from Iron Gate Dam.

- In coordination with members of the Geomorphology and Aquatics work groups, assess the need for “channel maintenance flows” in bypass reaches. The objective of these flows would be to restore and maintain channel features that provide aquatic/riparian habitat and to prevent “fossilization” of side channels, bars, and floodplain benches. These flows would be designed in a way that reflects the reductions in flood magnitude, duration, and frequency caused by the Project. In developing these flows, describe the manner in which the timing, frequency, magnitude, and duration of such flows will be determined. Downramping rates for flood spill (uncontrolled spill and channel maintenance floods) into bypass reaches would be developed in order to avoid impacts to the establishment and growth of riparian vegetation.
- Upon completion of the Analysis of Project Effects on Sediment Transport and River Geomorphology, and in coordination with the Geomorphology, Aquatics, and Terrestrial work groups, initiate development of a restoration plan to address ongoing impacts of canal sidecast in the J.C. Boyle bypass reach. The objectives of the effort would be to restore and maintain channel processes that affect aquatic and riparian habitat and lateral connectivity between the two. Describe the extent of aquatic and riparian habitats affected by the presence of sidecast material and develop measures to offset these impacts. Develop timelines for restoration implementation and monitoring.
- Stabilize and restore the area impacted by the J.C. Boyle emergency spillway overflow. Within one year of receiving a new license from FERC, initiate development of a plan to prevent additional scour and erosion of the hillslope below the spillway outfall. Designs for stabilizing and revegetating the existing scour area should be included in the plan. The plan should be implemented within three years of license issuance.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

It is the BLM’s conclusion that the Project may be substantially impacting geomorphic processes in numerous reaches of the Klamath River. PacifiCorp has not presented adequate information to assess these potential impacts, nor have they presented any proposed PM&E measures.

Fish Resources

Overview

No reference is made in the DLA to studies in progress for assessing Fish Species of Importance (4.2.3), Fish Passage (4.2.4), Existing Operational Measures (4.2.5), or Hatcheries (4.2.6). The DLA refers to the Fisheries DTR for technical information regarding these important components. Without the incorporation of completed study information into the DLA discussion of Results for Fisheries resources, the record is incomplete.

All Fisheries Resource information refers the reader to the Fish Resources DTR. However, the studies designed to address important aquatic issues generally have not been approved by the Plenary Process as developed by PacifiCorp and stakeholders. Thus, no conclusions can be reached based on the information provided in the DLA, as study results are unavailable. Logically, then the technical report is inadequately

describing existing conditions and Project effects on fisheries resources. PacifiCorp does not recommend PM&E measures for fisheries resources in the DLA.

Historical Fisheries Resources (4.1)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

Organization of fisheries resources in Exhibit E is confusing and requires cross-referencing between Historical Fisheries resources Section 4.1 and Existing Fisheries resources Section 4.2 in order to develop conclusions regarding the existing environment and potential Project impacts. Section 4.1 appears to be a review of the existing literature for the Klamath Basin fisheries resources. It should be noted that in each of the recommended studies for Fisheries resources, a literature review was part of each major study effort to describe existing information for the affected resource. The BLM recommends that PacifiCorp incorporate historical information into its discussion of existing conditions in order to assess ongoing Project impacts to fisheries resources.

Adequacy of Applicant's Information

PacifiCorp's discussion of species undergoing status review for listing under the Endangered Species Act appears incomplete (page 4-8). Status review of river lamprey and Western brook lamprey species is currently underway.

Describing Spencer Creek as being the only suitable habitat available for use in the J.C. Boyle Bypass is inaccurate (page 4-13). Hemmingsen et al (1992) suggest that little recruitment from Spencer Creek is occurring to the J.C. Boyle bypass reach. A PacifiCorp Project facility, the J.C. Boyle Canal emergency spillway, is likely a source of spawning gravel in the J.C. Boyle bypass reach.

The description of available tributary spawning habitat in the J.C. Boyle peaking reach is incomplete (page 4-14). More than Shovel Creek is available seasonally for trout reproduction. Other tributary streams with suitable spawning habitat include Long Prairie, Edge, Tom/Hayden, and Frain Creeks. In addition, there are other streams within the project area that may provide suitable spawning habitat which have not been thoroughly examined. Thus, PacifiCorp has yet to complete a full description of the tributary resources.

Redband trout population estimates (for trout > 178mm) described within the Salt Caves Fisheries resources report are subject to uncertainty (City of Klamath Falls 1986). PacifiCorp failed to provide a reference for the confidence intervals surrounding these estimates. The Upper Reach (JC Boyle Powerhouse to Caldera Rapid) estimate is 890 fish/mile with a 95% confidence interval of 763 to 1069. The Lower Reach (Caldera Rapid to proposed Salt Creek Powerhouse site) estimate is 1911 fish/mile with a 95% confidence interval of 475 to 7936. In addition there is no discussion of sampling methodology, the validity of methods used, or the probability that the populations have changed or remained the same over the last 17 years.

Within the discussion of Fisheries resources Downstream of Iron Gate Dam, Description of the Area, no mention is made of habitat availability and quality in the Trinity River (page 4-18). The Trinity is an important, if not the most important, tributary for fisheries habitat (Literature citation needed here). Failure to discuss its values and impacts on fisheries resources of the Klamath River would misrepresent the condition of the Klamath River.

The results of Olson (1996) are not presented in this work. This thesis would be useful in describing the migratory behavior of spring Chinook of the Klamath Basin, particularly the Salmon River.

PacifiCorp does not provide a complete picture in the description of the historical impacts to the Keno Reservoir from major land developments such as dikes for farming, roads (Highway 97), and railroad grades. These features have altered hydrologic connectivity to Lower Klamath Lake and flow regimes. PacifiCorp should assess the relationship between major historic land developments and the Project.

PacifiCorp does not incorporate information being collected by United States Geological Survey (USGS) and USBR into the historical information base of the DLA. USBR and USGS have ongoing monitoring work on ESA-listed sucker movement in Lake Ewauna.

PacifiCorp provides a general discussion of the J.C. Boyle Project reservoir (page 4-30). However, PacifiCorp fails to mention that this reservoir likely inundates critical spawning habitat for trout populations. This was discussed in the Fish Resources DRT but is not included in the DLA.

PacifiCorp provides no conclusion on the destination of trout migrating past J.C. Boyle Ladder (page 4-32) and does not mention, in Exhibit E, that a potential destination for trout passing J.C. Boyle Dam may include Upper Klamath Lake and its tributaries, as suggested on page 4-29 of the DLA for fish migrating past Link River Dam. PacifiCorp should provide a more thorough assessment of trout movement above J.C. Boyle Dam.

PacifiCorp provides a short discussion of Klamath River Tributaries (E 4.1.5). This discussion is missing a number of tributaries important to aquatic and fishery resources of the Klamath River above Iron Gate Dam. Other tributaries known to contain fisheries resource values include Jenny, Camp, Scotch, Long Prairie, Edge, Tom/Hayden, and Frain Creeks. There are likely additional tributary streams, (small second order streams) that provide important values to the fisheries resources within the bound of the Project facilities that have not been described or assessed by PacifiCorp.

PacifiCorp provides no discussion of historic anadromous habitat upstream of Iron Gate Dam in Section 4.1. Section 4.2 also lacks a discussion of historic habitat that may become available to anadromous species if access to these areas were restored.

Alternative Information or Interpretation

Livestock grazing conclusions are from studies conducted over 17 years ago. Current riparian condition regarding impacts from cattle grazing has changed (generally improved) in the upper J.C. Boyle peaking reach. The majority of livestock grazing impacts are likely due to PacifiCorp cattle management operations in the California section of J.C. Boyle peaking reach.

No discussion of stranding in the J.C. Boyle peaking reach is noted here. Stranding has been documented in the J.C. Boyle peaking reach and discussed within the Salt Caves Fisheries resources Report (City of Klamath Falls 1986). In addition, BLM biologists have documented stranding occurrence of juvenile sucker species within the Frain Ranch area of the J.C. Boyle peaking reach (Roninger 2001).

Spawning information appears incomplete for J.C. Boyle peaking reach. California Department of Fish and Game (CDFG) conducted oral interviews with W.G. Hoover where pre-Project spawning habitat for Chinook salmon was noted in the Frain Ranch area (CDFG 1965).

PacifiCorp indicates that some trout spawning in Williamson River originated from sources downstream of Link River dam. The use of the term "originating" is misleading. Movement past Link River Dam is both an upstream and downstream occurrence. The information presented in the DLA simply suggests that redband trout utilize a large portion of the system that is available to them, not where they originated from.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

The DLA does not adequately characterize the fisheries of the Klamath River and its tributaries. PacifiCorp does not adequately summarize or integrate the existing body of literature regarding the historic distribution of fish in the Project vicinity.

Existing Fisheries Resources (4.2)—River Fisheries Studies (4.2.1)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp describes the river fisheries resources in Exhibit E Section 4.2.1 and the Fish Resources DTR. PacifiCorp presents incomplete results from Fisheries Assessment (Study Plan 1.9) data by reach, presented as either catch per unit effort, species composition, or total fish captured based on collection methods used. PacifiCorp does not describe any continuing Project impacts on fisheries or propose any PM&Es for Fisheries resources.

Adequacy of Applicant's Information

The description of the river fisheries community appears inadequate. The purpose of the River Fisheries Studies (4.2.1) is to provide information to describe the existing condition of the fish communities in the Project area. This basic information is important and can be used to measure Project effects in conjunction with the results from other studies such as instream flow habitat analysis, water quality modeling, fish passage analyses, and ramping studies. This study plan has not been approved by the work group, and the ongoing manner in which the study is being implemented is inconsistent with draft study objectives.

Sampling of fish communities and habitats needs to be based on a rigorous design so that data are representative, ensure valid spatial and temporal comparisons, provide population-size estimates where possible, and form the basis for long-term monitoring. An additional objective of the study should be to identify spawning and rearing habitat for redband trout, suckers, and lamprey in areas where this information is currently lacking.

PacifiCorp has stated in work group meetings that they do not intend to collect any additional data beyond those field seasons already completed (fall 2001, spring/summer/fall 2002) with the exception of proposed additional fry study and Hydro-Acoustic sampling intended to supplement Reservoir Assessments. PacifiCorp has stated that they have sufficient information to meet FERC obligations for NEPA Analysis to describe the baseline condition of the fisheries resources present or affected by the Project (Aquatics Meeting Notes 5/6/03). BLM disagrees with this conclusion and recommends that PacifiCorp finalize the 4.2.1 study plan and implement it consistent with the plans objectives.

A single sampling effort per season per reach (sampling occurred during two fall seasons) is inadequate. Description of baseline conditions of the fisheries resources present in Project-affected reaches are subject to environmental changes outside the control of PacifiCorp operations. One year of sampling efforts to describe the existing resource will not address inter-annual variability that populations of fish are known to exhibit. Description and interpretation of fisheries resources are thus highly qualitative, as there is a limited ability to address short-term effects of environmental features on local populations. In addition, inadequate stratification in PacifiCorp's sampling scheme and the lack of replicate sampling would not allow for statistical analysis in order to compare future monitoring efforts relative to the existing information.

PacifiCorp did not collect any site-specific information on the lower river, choosing instead to rely solely on available literature to describe the existing condition and any continuing impacts the Project may have on lower river fisheries.

Alternative Information or Interpretation

Population Structure

Oregon Department of Fish and Wildlife (ODFW) fisheries biologists have noted that trout in the J.C. Boyle peaking reach area appear to be smaller in size on average than fish observed in the Keno reach of the river (Smith 2000, personal communication). Proposed riverine studies as described by PacifiCorp Fisheries Resources DTR, and work being conducted by ODFW, will attempt to provide additional information on age-class structure and length frequency for the Keno Reach. Limited results from these sampling efforts should be available in late fall 2003.

Trout captured in the upper J.C. Boyle bypass reach were in the 0+, 1+, and 2+ year age classes (City of Klamath Falls 1990). Trout in the lower J.C. Boyle bypass reach ranged in age from 0+ to 3+ years, with the majority in the 1+ and 2+ year age class bracket. By two years of age the mean lengths for the upper and lower bypass reach were 136 mm and 152 mm, respectively. No 4+ fish were collected in the bypass reach sampling.

Most trout present in the Oregon segment of the J.C. Boyle peaking reach were identified as 2+ to 4+ age fish. The general absence of age 0+ and 1+ fish was also noted (City of Klamath Falls 1990). At the time of the second annulus formation, the mean length of redband in the Klamath Wild and Scenic River (KWSR) was 171 mm, indicating that JC Boyle Full Flow trout were 19 mm to 35 mm larger than age 2+ trout collected in the Bypass Reach. By three years of age, the fish in the KWSR continued to be larger than fish from the lower part of the bypass reach.

The lack of older trout sampled in the bypass reach may indicate that adult trout habitat is more limited (Behnke 1992) in the bypass reach than in the J.C. Boyle peaking reach. Production of fry as a result of spawning in the bypass reach, and fry/juvenile habitat in the bypass reach not being fully seeded could contribute to skewing to early ages structure in the bypass reach. Differences in age structure between the bypass reach and the Oregon portion of the peaking reach could also result from the flushing of older fish downstream from the bypass reach during unscheduled spill periods due to inadequate refuge habitat in the bypass reach (City of Klamath Falls 1990). In addition, hydropower peaking could be causing stranding mortality of the fry and juvenile age-classes in the J.C. Boyle peaking reach. As a result, downstream movement and survival of juveniles in the J.C. Boyle peaking reach may be limited.

Excessive recruitment of trout into a population, where young and adult fish are competing for a common food supply likely results in short-lived, slow-growing individuals and a population whose biomass is tied up in small young fish (Behnke 1992). Based on the population estimates (as noted in Section 4.1 Historic Fisheries), redband trout length frequency distribution as noted, the existing conditions of poor upstream passage at J.C. Boyle Dam (Hemmingsen et al 1992), the potential flushing of trout in the bypass reach downstream, and power operations which provide suitable adult habitat only for individuals that escape the daily dewatering, it is possible that the trout population of the Full Flow Reach could be exceeding the existing limited carrying capacity and thus affecting the trout size/age structure. Keno Reach aquatic habitats are largely not exposed to these impacts from power operations and facilities. This lack of impact to the aquatic habitat in the Keno Reach appears to allow the trout to attain their larger sizes.

Potential Impacts of Project Facilities and Operations

Impacts to forage resources may also be occurring as a result of hydroelectric power operations, including water level fluctuation associated with J.C. Boyle powerhouse and poor downstream passage. The distribution of benthic organisms appears to be limited by these operations (City of Klamath Falls 1986). Benthic invertebrate production appears to be limited to locations in the riverbed that remained wet during the low flow period of the daily flow cycle.

The impacts of J.C. Boyle Dam and screen facility on downstream movement of forage fish into the J.C. Boyle peaking reach have not been studied. Studies of trout food habits in the bypass reach and J.C. Boyle peaking reach did not note the occurrence of prey fish species in stomach contents analysis (City of Klamath Falls 1990). Downstream passage concerns have been noted, including poor passage hydraulics and predation exposure in the forebay of J.C. Boyle Reservoir (FishPro 2000), which may limit the downstream movement of prey species.

The Oregon segment of the J.C. Boyle peaking reach contains poor rearing habitat due to high gradient and a wide range of velocities due to peaking operations by the J.C. Boyle Powerhouse (Henrikson et al 2002). Downstream dewatering of habitat resulting from hydroelectric impoundments would eliminate access to cover habitat and potentially degrade the quality of the existing habitat (Marcus et al 1990). Alteration of instream flows from power operation and changes in sediment regimes due to reservoirs can result in decreased bank stability and loss of riparian vegetation (Marcus et al 1990), which would decrease the cover habitat important to rearing trout (Behnke 1992). Rearing habitat in the California segment of the J.C. Boyle peaking reach would be similarly affected, as it is subject to the same suite of impacts.

Connectivity

Populations of trout residing in the Keno reach are largely disjunctive from the J.C. Boyle reaches (Hemmingson et al 1990, PacifiCorp 2000, Fish Pro 2001). Connectivity of populations is necessary to protect genetic viability and species adaptability to changing environments.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

PacifiCorp's operations and facilities at J.C. Boyle appear to have substantial impacts on fisheries in the Keno Reach, the J.C. Boyle bypass reach, and the J.C. Boyle peaking reach. Completion of ongoing studies, including additional sampling, is necessary in order to describe the existing fisheries community. Without additional sampling, use of the existing data would require a conservative set of recommendations and conditions on the license in order to minimize the effect of Project facilities and operations on the native fish community.

Reservoir Fisheries Studies (4.2.2)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp describes the Reservoir Fisheries resources in Exhibit E Section 4.2.2 and the Fisheries DTR. PacifiCorp presents the incomplete results from Fisheries Assessment (Study Plan 1.9) data for Keno Reservoir (Lake Ewauna). No other sampling was conducted by PacifiCorp within Fisheries Assessment Study 1.9. PacifiCorp presents reservoir sampling work conducted in 1998 and 1999 by Oregon State University for suckers and by-catch (Desjardins and Markle 2000).

PacifiCorp provides an overview of fisheries present in the reservoirs based on the presence/absence and empirical numbers from sampling data from Desjardins and Markle (2000) for J.C. Boyle, Copco, and Iron Gate Reservoirs. Some effort was made to integrate Keno Reservoir sampling with existing literature for comparison of species captured. Some discussion was presented regarding water quality parameters that may be affecting the fisheries community in Keno Reservoir.

PacifiCorp describes no continuing Project impacts regarding fisheries in the DLA (page 4-100) or Fish Resources DTR. PacifiCorp proposed no PM&Es to address concerns regarding either the impacts of reservoir fisheries on riverine fisheries or the impacts of Project operations on reservoir fisheries.

Adequacy of Applicant's Information

In the Reservoir Fisheries Studies (4.2.2), PacifiCorp has failed to develop a scientifically-rigorous study plan that addresses specific study plan objectives. The study plan needs to include a revision of the sampling protocol to include the open waters of the Project reservoirs, as has been requested during study consultation meetings (Aquatics Work Group 5/6/03). Results from this study plan would provide the basis for assessing the interaction of reservoir fishes with anadromous salmonids if passage was provided at all Project dams. Without this sampling, the fish communities that anadromous salmonids might encounter in the reservoirs cannot be adequately characterized and assessed.

PacifiCorp states that suckers may be moving downstream in search of improved water quality, using BLM (2002) and PacifiCorp (2000) as references (page 4-58). The reference to BLM (2002) as a source of this conclusion is not correct. PacifiCorp presents no evidence to support the conclusion that suckers may be moving downstream in search of improved water quality .

Alternative Information or Interpretation

Redband Trout

Potential change in fish numbers associated with change in ladder use was ascribed to reservoir impoundment at J.C. Boyle covering historic spawning habitat. Fish that were adapted to spawning in this reach were no longer able to complete their life history, thus this population declined. Loss of spawning habitat is a substantial impact to the native trout populations present in the Project affected reaches as a result of water impoundment. However, this is only one of many potential explanations as to the changes in use of the J.C. Boyle fish ladder. False attractions from Project facilities to upstream migrants, heavy predation of downstream migrants, and limitations to the downstream passage access point may also contribute to changes in ladder use.

Sucker Species

Lower Klamath River reservoirs may be acting as a catch basin for expatriated suckers from Upper Klamath Lake (Desjardins and Markle 2000). Juveniles and sub-adults survive in J.C. Boyle, while older individuals move downstream to Copco and Iron Gate. Although spawning and larva production has been documented, few to no larvae survive in these lower reservoirs. This may be because adult populations are too small, too few larvae are produced, habitat conditions are not favorable, or exotic predation/competition prevents recruitment of suckers to older age classes.

The relationship between sucker habitat availability and reservoir fluctuation in the Klamath River is poorly understood (Desjardins and Markle 2000). Lake level fluctuation can disturb littoral zone cover and substrate, and can also affect nutrient concentrations, light, temperature, phytoplankton and zooplankton abundance, and macroinvertebrates. Loss or alteration of any of these components could have a deleterious impact on sucker population stability. Substantial information demonstrates that

vegetated riparian areas are very important and support a greater abundance of fish species than non-vegetated areas.

Reservoir Habitat Characterization

Attraction flows to downstream bypass facilities are crucial in downstream fish passage. The potential exists that water within the reservoir may not flow in purely longitudinal directions. Most downstream bypass facilities, including those at J.C. Boyle, are designed for fish movement to go downstream along the full length of the reservoir. However work on the Pelton/Round Butte Project has indicated that predictions of surface water currents in reservoirs requires site specific study. Design of downstream passage facilities needs to account for current approaches to these facilities over multiple operational elevations.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

PacifiCorp proposes to conduct additional sampling in at least one Reservoir, using Hydro-acoustic technique, to describe the assemblage/abundance of fisheries within Project impoundments (Aquatics Work Group Meeting Notes 5/6/03). PacifiCorp's operations and facilities at Keno, J.C. Boyle, Copco, and Iron Gate Reservoirs appear to have substantial impacts on both native game fish species and listed sucker species. Completion of ongoing studies, including the additional sampling, is important in order to describe the existing fisheries community. Without additional sampling, use of the existing data would require a conservative set of recommendations and conditions on the license in order to minimize the effect of Project facilities and operations on the native fish community.

The relationship between sucker abundance and vegetation distribution in the Klamath Project reservoirs has not been studied. Analysis of lake level fluctuations on habitat availability and exotic fish communities as it relates to juvenile sucker recruitment would aid in a better understanding of early life history ecology of endangered lake suckers and impacts of Project operation on these early life-histories of listed suckers. Without additional sampling, the assumption would be that Project operations eliminate the habitat types that support juvenile sucker species and are thus removing these age-classes from the populations. This would appear to be particularly relevant at Copco and Iron Gate Reservoirs, where recruitment of juvenile suckers is not occurring.

Spawning by listed sucker species has been documented in the river reach above Copco reservoir. However, age class analysis has indicated that successful recruitment is not occurring in this reservoir (CDFG 2000). Sucker spawning has not been documented in the reaches upstream of J.C. Boyle and Iron Gate dams (Desjardins and Markle 1999). Specific information on the occurrence and distribution of adult reproduction in these reaches above the Reservoirs is crucial to future river and reservoir management.

Fish Species of Special Importance (4.2.3)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp describes the occurrence of fish species of special importance in Exhibit E Section 4.2.3 and the Fish Resources DTR. These species or ecological groups of fish species include ESA-listed suckers, ESA-listed coho, redband trout, lamprey, forage species, Klamath large scale sucker, and Klamath small scale suckers. PacifiCorp presents some existing literature for Lost River sucker, shortnose sucker, and coho salmon in the DLA. PacifiCorp refers to the Fish Resources DTR for description of redband trout and lamprey. PacifiCorp refers to DLA Section 4.1 and 4.2.1 – 4.2.2 and the Fish Resources DTR for information on all other species.

PacifiCorp describes no continuing Project impacts to Fish Species of Importance (page 4-100). Likewise, PacifiCorp proposes no PM&Es for Fish Species of Special Importance (page 4-100).

Adequacy of Applicant's Information

PacifiCorp does not discuss the information collected in Fisheries Assessment and presented in DLA Sections 4.1, 4.2.1, and 4.2.2 to describe the Fish Species of Special Important within the Project area. No discussion of ESA-listed sucker species is presented relative to the Project facilities and affected river reaches. The DLA contains no discussion of historic habitat used by ESA-listed coho within the Project area. Discussion of Chinook salmon and steelhead, additional species of importance, is absent from the DLA.

Alternative Information or Interpretation

Redband Trout

The Oregon Basin redband trout occupies remnant streams in seven Pleistocene era lakebeds in Oregon (ODFW 1995). Populations in each of these basins are completely isolated by natural geological features, except for those in the Klamath Basin. After Lake Modoc cut an outlet to the Pacific Ocean via the Klamath River, the lake became smaller as the outlet trenched down (Behnke 1992). After the connection to the ocean was made with the Klamath River, steelhead were known to migrate from the ocean to the Klamath Lake area.

Thousands of years of adapting to a drying environment have enabled populations of Klamath Basin redband trout to feed at higher temperatures than most other western trout. Typically, western trout are affected by increases in temperature, either by altered feeding behavior or displacement by more tolerant aquatic species (Behnke 1992). Native stocks of redband in the Klamath watershed have also evolved resistance to an endemic protozoa disease, *Ceratomyxa shasta*, which is highly lethal to nonnative trout (ODFW 1997).

Klamath River redband confront many environmental constraints, including low summertime base flows and concurrent decreasing water quality, lack of spawning gravel, cyclic water fluctuations from power generation, and potential competition from nonnative warm water fish (City of Klamath Falls 1986). Despite these problems, Klamath River redband in the J.C. Boyle peaking reach area have been able to sustain a sport fishery (ODFW 1997).

The loss of connectivity between lakes, marshes, and streams has interfered with the migratory life histories of Klamath Basin redband trout (ODFW 1995). Population productivity has been compromised because of the loss of important rearing areas. Gene flow among the Klamath redband trout populations has ceased or is reduced, and many Klamath redband trout populations are seriously fragmented. Some populations have likely been completely lost. The trout population that persists in the J.C. Boyle peaking reach area could be described as locally productive. However, due to passage limitations above and below the J.C. Boyle peaking reach, this population is very restricted in distribution. In addition, the factors that carried this population through natural drought cycles or provided for re-colonization in the event of die-off are potentially no longer available (ODFW 1995).

Close genetic similarity of redband trout exists between multiple stream populations in areas above Klamath Lake, including Spring Creek and Trout Creek, and areas below Klamath Lake, including Spencer Creek and Bogus Creek (Buchanan et al 1994). This genetic similarity suggests that the Klamath River redband trout, including fish within the J.C. Boyle peaking reach, are closely related to each other. In addition, ODFW noted genetic uniqueness of the populations of trout in the basin as evidence of a history of isolation from other evolutionary lines of trout (Buchanan et al 1994).

Sucker Species

Lower Klamath River reservoirs may be acting as a catch basin for expatriated suckers from Upper Klamath Lake (Desjardins and Markle 2000). Juveniles and sub-adults survive in J.C. Boyle, while older individuals move downstream to Copco and Iron Gate. Documentation of spawning and larva production exists for listed suckers in the California segment of the J.C. Boyle reach. However, few to no larvae survive in the lower reservoirs, either because adult populations are too small, too few larvae are produced, habitat conditions are not favorable, or exotic predation/competition prevents recruitment of suckers to older age classes.

The relationship between sucker habitat availability and reservoir fluctuation in the Klamath River is poorly understood (Desjardins and Markle 2000). Lake level fluctuation can disturb littoral zone cover and substrate, and can also affect nutrient concentrations, light, temperature, phytoplankton and zooplankton abundance, and macroinvertebrates. Loss or alteration of any of these components could have a deleterious impact on sucker population stability. Substantial information demonstrates that vegetated riparian areas are very important and support greater abundances of fish species than non-vegetated areas.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

PacifiCorp operations and facilities appear to have a substantial impact on Fish Species of Special Importance. Completion of ongoing studies, including additional sampling, is necessary in order to describe the existing fisheries community. Without additional sampling, use of the existing data would require a conservative set of recommendations and conditions on the license in order to minimize the effect of Project facilities and operations on these species of importance.

Fish Passage at Klamath Hydro-Electric Project Facilities (4.2.4)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp describes the facilities present at the Project, including basic information on passage structures and a limited history of fish passage facility purposes. Where existing passage facilities such as ladders or screens exist (J.C. Boyle, Keno, and Link River dams), current performance standards of each facility was presented in the DLA and compared with current state and Federal passage criteria for resident species. PacifiCorp describes no continuing Project impacts to Fish Passage based in the DLA (pg 4-100), and does not propose any PM&E measures to address fish passage issues at Project facilities.

Adequacy of Applicant's Information

Fish passage is strongly impacted by Project facilities. This section contains very little useful information to describe such significant impacts.

Study Results

Fish Passage Planning and Evaluation Study 1.10 and the subset of anadromous fish related studies (1.17 and 1.18) have not been approved by the Collaborative. Although some information has been collected in the Fish Passage Planning and Evaluation (Study 1.10), no interim or partial results are presented in the DLA (as has been done for other incomplete studies). Information that is currently available but not presented includes results of engineering reviews of proposed structural modifications, new facilities, or other fish passage options with potential associated costs as described in the Fish Resources DTR .

Where existing passage facilities such as ladders or screens exist (J.C. Boyle, Keno, and Link River dams), current performance standards of each facility were presented in the DLA. These standards should be compared with current state and Federal passage criteria for both anadromous and resident species to determine if modifications are necessary.

High Level Options Analysis

PacifiCorp agreed to conduct a high level analysis regarding dam decommissioning in the Fish Passage Work Group and failed to include it within the DLA. Inclusion of the information available for all reasonable alternatives needs to be provided to FERC for NEPA analysis of a full range of alternatives.

Characterization of Entrainment

A substantial body of literature demonstrates that entrainment and mortality in hydroelectric facilities often results in significant impacts to individual fish as well as fish populations. Because of the tremendous variability in entrainment and mortality between facilities, site-specific assessment of Project impacts is needed. To date, PacifiCorp has declined to initiate entrainment/mortality studies but has offered to conduct a literature review.

A literature review by itself will not provide an accurate assessment of Project impacts, but can be used as a starting point for more thorough analyses. As the first step to assessing Project impacts, a detailed description of Project facilities and a review of the literature on the type of entrainment and mortality associated with types of turbines and other facilities used in the Klamath Hydroelectric Project are needed. After the opportunity to review this literature, the Collaborative will be able to make a more informed decision on the timing, location, type, and appropriate methods and approach to out-migrant entrainment mortality studies.

Completion of entrainment and mortality studies are necessary to evaluate losses due to Project facilities and operations. These studies need to produce estimates, including entrainment and turbine mortality (including turbine fraction [the proportion of water passing through turbines]), bypass mortality (including bypass fraction), and spillway mortality (including spillway fraction). These estimates should be based on empirical, site-specific data collected during a range of representative conditions and over the appropriate period of time.

At each facility, PacifiCorp needs to estimate passage efficiency and facility-related mortality to out-migrant smolts. These would include estimates of collection mortality, trap and haul mortality, as well as estimates of mortality to be incurred by out-migrants through existing reservoir conditions under a variety of operational scenarios.

Potential for Reintroduction

PacifiCorp and their contractor have proposed using a phased approach to assess the potential for successfully reintroducing salmon and steelhead to their former range. For example, the first phase would use the EDT model to consider reintroduction potential for Spencer Creek. Further modeling could then include other geographic areas, such as Shovel Creek and areas upstream of Upper Klamath Lake. As the BLM has previously stated, during First Stage Consultation all fish passage options for the Klamath Hydroelectric Project should be seriously considered, and this will require an analysis of anadromous fish habitat that would be made available under these options. Therefore, once the work group is comfortable with modeling assumptions, PacifiCorp should include all potential fish habitat in the initial modeling effort rather than wait for future efforts.

In previous meetings, the BLM has requested that all assumptions used in the fishery models be provided to the resource agencies for review. Often, these models are very sensitive to individual assumptions and input variables. A thorough discussion of the assumed model parameters used when site-specific information is not available and should be provided. The results of model-sensitivity analyses should also be discussed and provided. It is difficult to meaningfully interpret the modeling results without a full understanding of assumptions, inputs, and sensitivities.

In order to evaluate the likelihood that out-migrating anadromous salmonids could successfully travel through Project reservoirs, flow patterns in reservoirs should be mapped. Proposed facilities (such as smolt collectors) located outside the Project area would also need to be assessed for Project impacts and restoration impacts. Existing reservoir fish communities should be adequately characterized and evaluated for potential effects to out-migrants. An overall downstream passage efficiency and effectiveness assessment from spawning tributaries above Upper Klamath Lake to below Iron Gate Dam is needed. As part of this, the residualism of steelhead out-migrants should be estimated.

Investigation of Trout and Anadromous Fish Genetics

This study needs to be completed to evaluate impacts of the Project on the genetic structure of existing resident trout populations and potential introgression risk with introduced steelhead. The genetic composition of present stocks needs to be identified through literature reviews and laboratory DNA analysis. This study should extend downstream to the extent of Project effects and upstream of Upper Klamath Lake. Additional analyses are needed to identify and characterize the genetic variability and structure of anadromous fish stocks proposed for reintroduction. Descriptions of anadromous fish stocks should include a description of tolerance for known physiological parameters and habitat conditions that potential stocks would be exposed to in the Upper Klamath Basin.

Investigation of Juvenile Anadromous Fish Behavior and Survival

This study plan has only been approved in concept. PacifiCorp initially provided a radio telemetry-based study that was judged to be inadequate by the Collaborative. A scientifically rigorous study plan needs to be provided for review by the group. Once the study is implemented and data are analyzed, this information could provide an assessment of Project-related mortality of juvenile anadromous fish through the Project and a basis for PM&Es.

Alternative Information or Interpretation

Historically, the Klamath River was a passageway for anadromous fish, salmon, steelhead, and Pacific lamprey as they migrated to various tributaries of the Klamath River and Upper Klamath Lake (ODFW 1997). These fish runs were halted as early as 1910 by the start of construction at Copco I Dam (completed in 1917), which permanently blocked fish passage (City of Klamath Falls 1986). Five more dams were built on the Upper Klamath River. Copco I, Copco II and Iron Gate Dams are located in California. Link River, Keno, and J.C. Boyle Dams are located in Oregon (PacifiCorp 2000). All the dams on the Klamath River have affected fish species distribution throughout the Klamath Basin. J.C. Boyle, Keno, and Link River Dams have fish ladders intended for trout migration. Only J.C. Boyle Dam has a screening facility to prevent entrainment of fish into the power diversion canal.

The steelhead life history morphology was historically present in the Upper Klamath Basin, but is now considered extinct (ODFW 1995). This life history probably was introduced into the Upper Klamath Basin after the Pleistocene Lake Modoc opened to the Pacific Ocean (Behnke 1992). The novel traits in the Upper Klamath Basin group may have resulted from the interbreeding of the new invading *O. mykiss* with the original resident fish of the basin (ODFW 1995; Behnke 1992). Steelhead were documented as far up as the Link River (ODFW 1997).

Fall Chinook and spring Chinook salmon potentially spawned within the Sprague River (Klamath River Basin Fisheries Task Force 1992). Runs were seen as far up the Sprague River as Beatty, Oregon, and spawning was reported in the North and South Forks of the Sprague. Historically, entry of spring Chinook to the Upper Klamath River area probably occurred in March. Fall Chinook entry to the Sprague River was noted in September and October.

The coho adapted to the Upper Klamath Basin had been lost sometime prior to fish collections between 1914–1918 at the Klamathon Racks (Klamath River Basin Fisheries Task Force 1992). Currently the Southern Oregon/Northern California Coastal Coho Salmon Evolutionary Significant Unit (which includes the Klamath River populations downstream of Iron Gate Dam) was listed as threatened under the Endangered Species Act in 1997 (62 FR 24588). Designated critical habitat for Southern Oregon/Northern California Coastal coho salmon occurs downstream of Iron Gate Dam (May 5, 1999; 64 FR 24049).

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

Construction of Copco and Iron Gate Dams has eliminated anadromous fish passage in the Upper Klamath Basin. The persistence of resident salmonids (redband trout) in much of the Project area and in the Upper Klamath Basin suggests that reintroduction of anadromous fisheries is reasonable and efforts to assess methods for reintroduction of anadromous salmonids should continue. Fish passage is necessary to restore and protect fishery resources.

Potential Terms and Conditions:

- Meet State and Federal standards for fishways on all hydro-electric facilities connecting Wild and Scenic Upper Klamath River, including JC Boyle Reservoir and the CopCo facilities. Fishways would include upstream passage facilities (typically ladders) and downstream facilities (typically intake screens).
- Complete Fisheries Assessment Study and Fish Passage Study to develop fish passage concepts that meet the existing state and federal passage standards.
- Provide unobstructed routes for migrations within all reaches directly affected by the Project.
- Debris resulting from power operations or facility construction would be modified or removed in order to provide passageways and flow concentrations for migration.
- Operations that result in false attractions or inadequate attractions would be identified and corrected both in the river (Keno, JC Boyle fullflow and bypass reaches) and the length of the reservoirs and dam forbays (JC Boyle and CopCo Complex).
- Complete peaking Study, Reservoir Passage and Entrainment Study, Fisheries Assessment Study in order to provide information which will identify migration impacts and actions to minimize or eliminate impacts.

Existing Operational Measures Relevant to Fish Resources (4.2.5) (Peaking, Ramping, and Instream Flow)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp describes the Existing Operational Measures in Exhibit E Section 4.2.5. There is a general discussion of ramp rates and minimum flows determined by FERC license articles or subsequent Biological Opinions. There is a general discussion of facility capacity and flow release made from Project facilities.

PacifiCorp describes no continuing impacts of Project operations on fisheries resources (page 4-100). They also proposed no PM&Es for Operational Measures effects to fisheries resources (page 4-100).

Adequacy of Applicant's Information

Peaking and ramping operations are known to cause continuing impacts on fisheries resources in the Link River and J.C. Boyle peaking reach, yet no mention is made in the DLA. No references are made to the DTR. PacifiCorp presents no discussion of results from Ramping Study 1.7, Instream Flow Study 1.12, or Peaking Study 1.18.

Peaking

The effects of daily flow fluctuations in the J.C. Boyle reach are significant Project impacts to aquatic and riparian resources (including macroinvertebrates) that need to be understood and quantified. The study plan intended to address these impacts remains in the conceptual phase and needs to be fully developed for review by the stakeholder group in a timely manner. The study was specifically requested at the August 2002 Aquatics Work Group meeting, with a detailed study plan to be developed in early 2003. Completion of this study will provide information needed to understand Project impacts.

Ramping

Ramping studies at Link River and JC Boyle fullflow reach were conducted by PacifiCorp in order to describe the occurrence of stranding and potentially the extent of stranding in these reaches. PacifiCorp provides no discussion of results from those study efforts. There are 33 side channels in the fullflow reach which may contribute to heightened stranding risk. Stranding impacts or risks have not been described in the DLA or fish resources DTR.

To date, PacifiCorp has suggested that their Project operations do not affect ramping rates below Iron Gate Dam. Therefore, they have not prepared an adequate study of associated effects. Instead, PacifiCorp has stated that USBR's Klamath Project operations result in the ramping rates observed below Iron Gate Dam. In contrast, resource agencies have repeatedly asserted that while the USBR Project does currently affect river flows below Iron Gate Dam (e.g., monthly average flows), PacifiCorp does have operational flexibility that affects ramping rates (e.g., hourly and daily ramping rates). In fact, the current FERC license includes limits on ramping rates below Iron Gate Dam, and this consideration must be included in the relicensing process.

Although PacifiCorp has prepared a draft ramping rate study that may include the river reach below Iron Gate Dam, the existing language in the draft study plan is inadequate. A sufficient ramping rate study should include a description of how ramping operations occur at Iron Gate Dam and the resulting Klamath River stage height changes between Iron Gate Dam and the Shasta River, an inventory of potential fish stranding areas related to specific river stage height changes, and identification of ramping rates that sufficiently minimize fish stranding potential.

Instream Flow

The study plan designed to support this section of the DLA is still under development and has not been approved by the Collaborative. Significant issues that still need to be resolved by the work group include habitat suitability criteria development, appropriate methods to be used in the Keno reach, and PHABSIM output analysis. Field data collection has been ongoing without stakeholder approval of the final study plan. This study is especially time sensitive and needs to be finalized as soon as possible, as it will provide information of great utility to the development of instream flow regimes.

PacifiCorp committed to developing site-specific habitat suitability criteria (HSC) for redband trout and, if possible, other resident species. To date, the number of observations needed to develop HSC for redband trout has not been completed as described by the Instream Flow Incremental Methodology (IFIM) (Bovee 1986). In addition, data collection for redband trout HSC was limited in geographic scope (data was collected only in the J.C. Boyle Bypass reach). Additional data collection across a broader geographic scope is necessary to determine appropriate redband HSC for the study area.

PacifiCorp has not developed instream flow modeling in the Keno reach. PacifiCorp contends they lack control of flows within this reach and that there is a lack of consensus regarding appropriate methodologies. The BLM believes that instream flow modeling in this reach will be of great utility in describing baseline conditions, understanding ongoing Project impacts under a new license, and exploring impacts of alternative Project operations on aquatic habitat. BLM comments on the Second Stage Consultation Document (SSCD) recommend that instream flow needs in the Keno reach should be assessed using IFIM techniques.

PacifiCorp has not adequately described their methodology for conducting the analysis of PHABSIM output or how they intend to interpret results. Edge cells, shear zones, and velocity shelters are important characteristics for describing available habitat under various flow regimes within the PHABSIM modeling. PacifiCorp needs to develop methodologies for addressing these characteristics.

Specific Comments Regarding Existing Operation Measures

PacifiCorp notes that load factoring allows recreational rafting opportunities during summer months (page 4-75). This has nothing to do with the description of operational measures effect on fisheries resources. However, there are impacts to recreational fishing opportunities in the Peaking reach from load-following. The daily fluctuation in flows results in major swings in trout catch-rates in the peaking reach. During peaking events, catch-rates are typically low, and during shut-off times, catch-rates are fairly high.

PacifiCorp includes a discussion of unscheduled powerhouse shutdowns at J.C. Boyle facilities (page 4-75). There is a failure to mention the geomorphic impact of these Project shutdowns on the emergency spill area associated with the canal (BLM letter to FERC, dated April 26, 2002). Substantial flow releases at this emergency spillway have resulted in approximately 80,000 cubic yards of debris being washed into the Klamath River, causing both negative and beneficial effects. Debris load has resulted in moving the river channel to the left increased bank erosion. However, the spillway is the only major source of gravel downstream from J.C. Boyle Dam and has resulted in creation of the only habitat known to support spawning in the mainstem Klamath River channel in either the J.C. Boyle bypass or the upper segment of the peaking reach.

Alternative Information or Interpretation

Differences in age structure between the J.C. Boyle bypass and peaking reaches (see above, River Fisheries Studies, Alternative Information or Interpretation) could include flushing of older fish downstream from the bypass reach during spill periods due to inadequate refuge habitat (City of Klamath Falls 1990). Hydropower peaking could be causing stranding mortality of fry and juvenile fish in the J.C. Boyle peaking reach. Potential spawning in the bypass reach, as well as fry and juvenile habitat in the bypass reach not being fully seeded, could contribute to skewing to early ages structure. As a result, downstream movement and survival of juveniles in the J.C. Boyle peaking reach may be limited.

Alternatively, the difference in growth rates between the bypass reach and the Oregon portion of the J.C. Boyle Peaking reach may also be explained by the general differences in water temperature and variability of water temperature differences between these two areas (City of Klamath Falls 1990).

Peaking

Abnormal fluctuations in daily and seasonal flow patterns created below the Project facilities can lead to dewatering of spawning beds, low flow and high flow induced spawning interference, incubation mortality, and rearing mortality of resident fish (Marcus et al 1990). Downstream dewatering and desiccation of spawning habitat is a documented occurrence in the J.C. Boyle peaking reach (City of Klamath Falls 1986). Downstream dewatering and desiccation are undoubtedly the worst of the possible adverse impacts on existing fisheries resources in the peaking reach (Marcus et al 1990).

Daily temperature fluctuations of up to 12 degrees Celsius occur in the J.C. Boyle Peaking reach during the middle of the summer (City of Klamath Falls 1986) as a result of daily peaking events. The effects of these large diurnal temperature fluctuations on the existing cold water fish populations has not been studied specifically for the J.C. Boyle Peaking reach. It can be assumed that water temperature fluctuation impacts to fisheries may include elevation of temperatures beyond the range preferred for rearing, inhibition of upstream migration of adults, increased susceptibility to disease, reduced metabolic efficiency, and shifts in competitive advantage between fish species (Hicks et al 1991).

Ramping

The extent and cumulative impacts of stranding have not been studied in the J.C. Boyle peaking reach (CDFG 2000), but the occurrence of larval stranding has been documented (City of Klamath Falls 1987). The most common habitat types in the J.C. Boyle peaking reach are shallow rapids, riffles, and runs. Channels with an abundance of shallow habitat are more likely to have larger areas exposed during down ramping where fish could become separated from the main river flow due to declines in stage (StillWater 1999). The large flow fluctuations associated with the J.C. Boyle powerhouse can cause high mortality to young trout through stranding (City of Klamath Falls 1990).

Instream Flow

The BLM has completed a study on the fullflow reach using PHABSIM technique including recommended minimum flows to meet habitat needs for fry, juvenile, and adult redband trout. The BIA has conducted instream flow analysis on Link River. Both of these studies provide information on available habitat and provide recommended flows to protect the available habitat in these reaches.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

Ramping rates currently applied to the Project exceed most ramp rate standards on the West Coast. Stranding of fish is a documented occurrence in the J.C. Boyle peaking reach (City of Klamath Falls 1987). As noted in Agency Alternative Information under River Fisheries Studies Comment, the J.C. Boyle section of the river does not appear to promote growth of trout to the same degree as the Keno Reach, which is not subject to such frequent or severe flow fluctuations. Keno does occasionally ramp, but not as frequently as the J.C. Boyle facility. J.C. Boyle operations appear to have a detrimental impact on growth and maturation of resident trout. Completion of proposed studies would assist in discerning the degree of impact that ramping rates and peaking have on native trout.

Potential Terms and Conditions:

- Occurrence, duration and magnitude of peaking, ramp rates and instream flows will be designed to minimize the impact to native fisheries of the Klamath River.
- Provide for outmigration of juvenile salmonids and lamprey species; and optimize instream habitat for resident populations during base flows.
- Complete the instream Flow Study, Peaking Study, Ramping Study, Riparian Study, and Water Quality Study to determine flow regimes that support the various life stages and lifehistories of resident and anadromous fish.

Iron Gate Hatchery Operations (4.2.6)

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

PacifiCorp provides a very general description of Iron Gate Hatchery Operations in Section 4.2.6 of Exhibit E. They present the production goals of the Iron Gate Hatchery, but describe no continuing Project impacts of Iron Gate Hatchery to fisheries resources and propose no PM&Es for addressing impacts of Project operations on fisheries resources (page 4-100).

Adequacy of Applicant's Information

Fish Passage Planning and Evaluation Study 1.10 and the subset of anadromous fish related studies (1.17 and 1.18) have not been approved by the Collaborative. Unlike other studies, however, PacifiCorp fails to include partial results of the hatchery evaluation conducted as part of the Fish Passage Planning and Evaluation (Study 1.10).

PacifiCorp presents in the DLA a discussion of "New Considerations" (for Iron Gate Hatchery Operations). Similar discussions are not present in any other section of the Fish Resources DTR. The report proposes increased Chinook tagging and marking and Heating Incubation Water, and includes a description of facilities and methods of achieving these concepts. Effort went into developing these actions, yet the DLA does not mention this new section or PacifiCorp's objectives for presenting this information in the report.

PacifiCorp has not presented any information in order to determine whether the hatchery is creating genetic, behavioral, or ecological effects upon naturally and artificially spawned populations in the Klamath River and tributaries. No discussion is presented on the potential role that existing hatcheries (Fall Creek and Iron Gate) could play in restoration of anadromous fish above Iron Gate Dam.

The fall Chinook return to Iron Gate Hatchery in the fall of 2000 was the largest on record. PacifiCorp provides no discussion on any Iron Gate Hatchery release practices that may have affected the production of the 1997 brood class. PacifiCorp provides no discussion on what the river conditions (such as flow or water quality) were during the time of the 1998 out-migration (1997 brood year). The returns of adult steelhead to Iron Gate Hatchery during the 1990s were only about 10% of returns before 1990; the cause of this decrease has not been discussed.

The impact of Iron Gate Hatchery operations (including the release of large amounts of juveniles at essentially one time) on wild salmonids and other hatchery fish within the Klamath River system is unknown. Information is needed on how the habitat, run timing, and growth of out-migrating wild fish are affected. The Hatchery Evaluation component of the Fish Passage Planning and Evaluation study will

provide information necessary to protect and enhance the outstandingly remarkable anadromous fishery value of the Klamath Wild and Scenic River (downstream from Iron Gate Dam).

The effects of Iron Gate Hatchery operations on fish health and native assemblages of fish need to be determined. Questions to be answered include:

- Have Iron Gate Hatchery operations retained all upriver anadromous genotypes that were originally present upstream of Iron Gate Reservoir?
- Have the genetics of wild stocks and species within the Klamath River System been altered by Iron Gate Hatchery operations? If so, what are the implications for species sustainability?
- Is the current location of the Iron Gate Hatchery best suited to minimize impacts to aquatic resources in the Klamath River and to fulfill the requirement for mitigating for lost habitat upstream?
- Can the Iron Gate Hatchery play a role in the recovery of ESA-listed species in the Klamath River System?
- How can Iron Gate Hatchery practices be modified to reduce impacts to wild fish and other aquatic organisms in the Klamath System?
- What is the estimated survival for each species of Iron Gate Hatchery stocks in reaching the Pacific Ocean? What is their condition and size as well?

Alternative Information or Interpretation

Until the early 1900s, spring Chinook were the dominant chinook race in the Klamath River system, but Iron Gate Hatchery is now managed for production of fall Chinook. Currently, summer steelhead and spring Chinook are largely extirpated from their historical range in the upper mid-Klamath region and associated tributaries. The Klamath Mountain Province steelhead trout is listed as an ESA Candidate species and the Southern Oregon/ Northern California Coastal coho salmon is listed as an ESA Threatened species. Annual returns of adult steelhead to Iron Gate Hatchery are very low, and Chinook salmon and coho salmon returns are highly variable, despite rather constant hatchery production of fry.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

Construction of Copco and Iron Gate Dams has had profound impacts on distribution of anadromous species in the Upper Klamath Basin. Development of the Iron Gate Hatchery complex was intended to maintain populations of anadromous salmonids from the Upper Klamath River to mitigate for loss of access to historic habitat. Since development of the Iron Gate facility, one anadromous species has been listed under the ESA, and four are currently under review for listing. Hatchery operations and production goals for Chinook salmon, coho salmon, and steelhead smolts do not appear to be achieving basic objectives of providing a stable fishery resource for downstream uses.

Federal Fish Management (4.3.2)

There is no mention of BLM management objectives for the Project reaches affecting BLM lands. Many of these objectives are discussed in Part I of these comments. Other fisheries-specific management objectives include:

PACFISH/INFISH

The BLM management for anadromous and resident fish habitat within the Columbia River Basin, including the Upper Klamath Basin east of Klamath Falls, is guided by PACFISH and INFISH and related Biological Opinions issued by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Bring Back the Natives

Bring Back the Natives is a national effort by the Department of Interior - BLM, the U.S. Department of Agriculture - Forest Service, and the National Oceanic and Atmospheric Administration - National Marine Fisheries Service, to restore the health of entire riverine systems and their native species.

Fish and Wildlife 2000

Fish and Wildlife 2000 is a program designed to improve the management of fish, wildlife, and their habitats on BLM-administered lands.

Botanical Resources

Issues

Noxious Species

The Project and associated roads and facilities contribute to the spread of noxious and weedy plant species, placing desired native plant communities and special status plant species at risk.

Special Status Species

Habitat loss from Project reservoirs and Project facilities continues to directly and indirectly affect special status plant species and their habitat.

Forest Health and Fuels Reduction

Extremely dense conifer stands with ladder fuels that can carry ground fires to the forest canopy typify the Project area. Accumulated logs and other dead materials also contribute to the risk of stand-replacing fires. The dense, stressed, stands are also at risk of insect infestation. Heavy fuel loads exist on forests, woodlands, and shrub fields in the Klamath River canyon. Historically, this area has received a high number of lightning strikes. Given the steep terrain, any fire occurrence could become a forest stand-replacing event.

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

Noxious Species

The DLA does a good job documenting the presence of noxious weeds and exotic invasive species in the Project area. The DLA also does a good job describing the relationship between noxious weed invasion and spread and the introduction of those species and ground-disturbing activities since Euro-American settlement. The continuing impacts section recognizes the potential effects of Project operation on the continued spread of noxious and invasive species. However, in the detailed discussion of transmission rights-of-way, the DLA states that the spread of noxious weeds is affected more by other activities than

by Project operations. The conclusions also suggest that Project flow regimes are not a major influence on the presence of noxious weeds in riparian areas. The BLM disagrees with these conclusions. Although impacts of Project operation are described, the DLA fails to include PM&E measures.

Special Status Species

The DLA does a good job documenting the presence of special status plant species in the Project area. However, the DLA attributes impacts to these species to high flows that may or may not be controlled by Project operations. The DLA fails to recognize past and continuing impacts to special status plant species from alteration of habitats resulting from timber harvest, grazing and fire suppression, introduction and spread of noxious weeds, flow regime changes, and inundation from reservoirs. Although impacts of Project operations are described, the DLA fails to include PM&E measures.

Forest Health and Fuels Reduction

The DLA does a good job under Historical Terrestrial Resources describing the altered vegetation conditions that have resulted from timber harvest, grazing (indirect fire suppression from the consumption of fire fuels), and fire suppression that have occurred since Euro-American settlement. However, no connection is made between past, current, or future fire suppression activities and the protection of Project facilities. The DLA does not include PM&E measures.

Alternative Information and/or Interpretation

Noxious Species

BLM management objectives are to avoid the introduction or spread of noxious weed infestations in any areas, and to contain and/or reduce existing noxious weed infestations using an integrated pest management approach (KFRA ROD and RMP, 1995). Noxious weeds and invasive exotic plants have a negative effect on native species diversity, ecosystem health, and quality recreational experiences. The largest concentrations of yellowstar thistle (*Centaurea solstitialis*) occur in association with the power plant and power line corridors leading away from the power plant, and in the grazing areas in California. Smaller concentrations occur throughout the areas, mostly in association with roads connected to the power plant area.

The relationship between disturbance and the introduction and infestation of noxious weeds described in the DLA should be recognized when analyzing the effects of Project facilities and activities. If the permanently disturbed rights-of-way and the artificial flow regimes are disturbance factors contributing to noxious weed infestation, then these Project facilities and operations should be attributed as the predominant cause, continued persistence, and spread of noxious weeds within the Project area and the surrounding landscape.

Protection, Mitigation, and Enhancement Measures

For the purpose of preventing, suppressing, and containing noxious weeds, PacifiCorp shall implement the following activities within the Project area:

- Periodic, systematic surveys of all lands within the Project area shall be conducted in order to provide information on the distribution of noxious weeds in areas affected by the Project. Operations surveys should be most intensive on roadsides, PacifiCorp's facility grounds, transmission lines, and at recreation sites and other disturbed areas where noxious weeds readily become established. Locations of known populations should be recorded with a GPS, and this information should be used to produce both

digital and spatial (e.g., GIS) data layers that include information on species, location, density, and real extent of infestation.

- Development and implementation of a noxious weed management plan for the Project area that incorporates the principles of integrated weed management. Components of an integrated weed management plan should include prevention and detection, integrated control methods, awareness and education, coordination, native plant community restoration, and monitoring and evaluation. Integrated control methods should include cultural, physical, biological, and chemical control techniques.
- Coordination of noxious weed management within the Project area shall include formation of a Cooperative Weed Management Area (CWMA). The CWMA would include all landowners within the Project area and facilitate cooperation and coordination of noxious weed management across ownership boundaries.
- Complete all necessary NEPA environmental analyses prior to implementation of noxious weed control activities.

Special Status Species

BLM management objectives for special status species emphasize protection, management, and conservation of Federal listed and proposed species and their habitats to achieve recovery in compliance with the Endangered Species Act (Act), approved recovery plans, and Bureau special status species policies. The BLM manages for the conservation of Federal candidate and Bureau sensitive species and their habitats so as not to contribute to the need to list (as threatened or endangered) and to recover the species. The BLM manages for the conservation of state-listed species and their habitats to assist the state in achieving management objectives. The BLM emphasizes protection of Survey and Manage species so as not to elevate their status to any higher level of concern. Finally, the BLM studies, maintains, and restores community structure, species composition, and ecological processes of special status plant and animal habitat (KRMP ROD and RMP, page 36).

Applegate's milkvetch (*Astragalus applegatei*), listed as endangered under the Act, occurs on alkaline floodplains associated with the Klamath River. Remnant populations occur on the former floodplain of Lake Ewauna and on Miller Island. One new population of Applegate's milkvetch was found within 45-100 feet (17-30 meters) of Keno Reservoir during the inventory conducted by PacifiCorp. The type location of this species was adjacent to the Klamath River near Keno. Lands flooded by Boyle Reservoir as a result of the installation of Boyle Dam undoubtedly supported potential habitat for this species.

Red root yampah (*Perideridia erythrorhiza*), a Bureau sensitive species, occurs in seasonally wet meadows. Several populations have been documented in the Project and adjacent areas. However, flooding by reservoirs and alteration of river hydrology have altered or destroyed habitat for these species along the Klamath River, and Project associated roads have disrupted the natural hydrology of seasonally wet meadows within the uplands, further reducing potential of these species.

Columbia cress (*Rorippa columbiae*), a Bureau sensitive species, occurs on gravelly substrates in seasonal drainages in Klamath County and along the edges of the Columbia River in Washington. Changes in river hydrology and flooding by reservoirs has eliminated habitat along the Klamath River for this species.

The mountain lady slipper orchid (*Cypripedium montanum*), a Survey and Manage and Bureau tracking species, is known to occur in one riparian area within the Project boundary. Alteration of river hydrology and flooding by reservoirs have reduced riparian habitat within the Project area.

Preliminary Terms and Conditions

For purposes of mitigating the direct and indirect effects on special status plant species and their habitat and increasing opportunities for unique habitat protection, restoration, and improvement, PacifiCorp shall implement the following activities within the Project area:

- If not completed as a pre-application study, a systematic survey of all lands within the Project area shall be conducted to provide information on the distribution and habitat associations of special status plant species.
- PacifiCorp shall participate in and fund the development and implementation of the recovery plan of Applegate's milkvetch in order to mitigate the continuing effects of the Project on this endangered species.
- Botanical surveys for special status plant species prior to ground-disturbing activities shall be conducted to BLM standards and guidelines.
- Roads which cross seasonally wet meadows shall be removed and the natural hydrology of those meadows shall be restored.

Forest Health and Fuels Reduction

BLM management objectives for forest health emphasize the use of prescribed fire for site preparation, fuel reduction, and to restore or retain natural ecological processes through site disturbance. Use of prescribed fire contributes to reduce tree mortality and restoration of stand vigor, resiliency, and stability that is necessary to achieve land use allocation objectives established in BLM management plans. Use of prescribed fire includes but is not limited to fuels management for wildfire hazard reduction, restoration of desired vegetation conditions, management of habitat, management of fire dependent/adapted species, and silvicultural treatments (KRMP ROD and RMP).

Previous to development of the Project area, periodic lightning-ignited natural fires and Native American burning maintained forests in the Project area in an open condition. Recurring fires burned through forest stands generally as relatively light ground fires, limiting understory vegetation to perennial grasses and occasional groups of small trees. Widely spaced, large-diameter Ponderosa pine and Oregon white oak gave much of the area a savanna-like appearance.

Elimination of burning by Native Americans, grazing of ground fuels, and active fire suppression have limited fire as a disturbance agent in most of these plant communities. Assuming an average fire-return interval of 15 years, an average of eight light ground fires has been missed. In many stands, the Douglas fir understory component has increased in density, as has the pine understory.

Preliminary Terms and Conditions

For the purpose of reducing the risk of a stand-replacing wildfire and/or insect attack, PacifiCorp shall implement a conifer forest and woodland treatment program that would eventually include all stands, and treat approximately 2,500 acres in the first decade. Fuel treatments would occur in the entire planning area, from the river to the first serviceable road above the canyon rim. The treatment of fuels would place

greater emphasis on the use of prescribed fire (to mimic the natural fire regime). Location of treatment sites would occur throughout the canyon. The treatment program would involve:

- Reduce overstocking by thinning throughout the Project area. Each potential treatment area would first be examined to determine stand condition and develop prescriptions for thinning and follow-up fuel treatment. Cutting excess trees yields large volumes of dead wood, which is fuel for potential wildfires. Further treatment of this material is necessary to reduce the overall fire hazard in the Project area.
- Should wildfires, insect mortality, or other stand-replacing events occur, salvaging the trees for timber products would be considered, especially to reduce the high fuel loads of the dead trees and promote long-term forest health. Follow-up treatments to reestablish conifer forest and woodland stands would include tree planting, controlling competing vegetation, animal damage control, and later, density control thinning of the resulting young stands.
- Where larger, old-growth trees have a dense understory of small trees and other vegetation below them, the larger trees are commonly under moisture stress. Understory trees would be heavily thinned out to relieve stress on large trees.
- Following initial fuel reduction, a maintenance underburn program would be established to periodically run light underburn through the stands to reduce fuel loading and understory densities.

Several types of fuel treatments shall be used, including manual treatments and treatments using a tracked low pressure swing excavator used to break down vegetation, followed by piling. Prescribed fire would be used to reduce fuels and to alter vegetation in coniferous and deciduous forests and shrub fields.

Wildlife Resources

BLM management of wildlife resources emphasizes noxious and invasive, non-native, special status, avian, migratory, and big game species, as well as unique habitats and unique features (e.g., coarse woody debris, juniper). Among the resources of primary interest to the BLM are parasitic species (e.g., brown-headed cowbirds and bullfrogs), native and non-native herptiles (e.g., bullfrogs, Western pond turtles), big game and migratory species, avian species and the effects of transmission lines, coarse woody debris, juniper, and riparian and wetland habitats. The DLA lacks a thorough analysis of the effects of Project operation on wildlife resources. A list of issues and detailed evaluation of how the DLA addresses these follows.

Issues

Brown-Headed Cowbird

Project facilities, maintenance, and operations have contributed to an increase in the brown-headed cowbird populations in the Project area that has had a negative impact on native passerines.

Bullfrog

Project facilities, maintenance, and operations have contributed to the bullfrog population in the Project area having a negative impact on native herptile populations.

Bald Eagle

Bald eagle surveys in the Project area were discontinued in 2003.

Big Game

The assessment of Project effects on big game movements was not adequately studied.

Wildlife Entrainment

The assessment of wildlife entrainment in Project canals was not adequately studied.

Transmission Line Effects on Avian Species

The effects of transmission lines on avian species were not adequately analyzed.

Coarse Woody Debris

Snag and coarse woody debris numbers, quality, and distribution may be affected by Project roads, increased access to the Project area, and Project operations. The effects of Project operations on snags and coarse woody debris were not adequately analyzed.

Western Pond Turtle

The effects of peaking operations of J.C. Boyle on western pond turtle basking sites were not addressed.

Wetland and Riparian Habitat

The effects of Project operation and condition of riparian and wetland areas were not adequately analyzed.

Noxious Species

Certain aspects of Project facilities, maintenance, and operation have contributed to the expansion of noxious weed populations in the Project area having a negative effect on native plant populations and wildlife habitat in certain areas. The effects of Project operations and facilities maintenance were not adequately analyzed.

Juniper

Juniper encroachment as a result of fire suppression is an indirect effect of Project operations on wildlife contributing to habitat degradation for various species. The effects of fire suppression and consequent juniper encroachment on habitat condition has not been adequately analyzed.

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

Brown-Headed Cowbird

PacifiCorp's landbird studies have shown that brown-headed cowbirds were relatively common and abundant throughout the study area. The DLA lacks a discussion of Project impacts on brown-headed

cowbird populations. No PM&Es were proposed to address this non-native bird and its impacts to native passerine populations.

Bullfrog

PacifiCorp's amphibian and reptile survey data show that bullfrogs inhabit and successfully breed throughout the Project area, imposing substantial predatory pressure on native amphibians and reptiles. The DLA lacks a discussion or statement of conclusion regarding Project impacts on bullfrog populations. No PM&Es were proposed to address this non-native amphibian and its impacts to native herptiles.

Big Game

PacifiCorp has concluded that there are no adverse effects on big game movement as a consequence of Project operations, and that there is no documentation of increased deer mortality associated with Project canals or reservoirs. Thus, PM&Es have not been proposed to address impacts to big game as a consequence of Project operations.

Wildlife Entrainment

PacifiCorp has concluded that medium and large mammals are not entrained in Project canals with any regularity, and that Project canals (e.g., Fall Creek, East Side, and West Side) do not represent an entrapment hazard to big game or other wildlife because water velocities are low and canal bank construction (e.g., earthen bank) provides animals a means of escape. Thus, no PM&Es were proposed to address impacts of canal entrainment on wildlife.

Transmission Line Effects on Avian Species

PacifiCorp has concluded that Project transmission lines do not present a problem for avian species (e.g., electrocution, collision). Thus, no PM&Es were proposed or discussed to address the impacts of transmission lines.

Coarse Woody Debris

PacifiCorp has concluded that snag and coarse woody debris distribution varies throughout the Project area. The DLA does not include a discussion distribution varies throughout the Project area. The DLA does not include a discussion of coarse woody debris, Project effects on distribution, or PM&Es.

Western Pond Turtle

The DLA does not address Project impacts corresponding PM&Es relevant to pond turtles.

Riparian and Wetland Areas, Noxious Weeds, and Juniper Encroachment

The effects of Project operations on riparian and wetland areas, noxious weeds, and juniper encroachment are addressed within the terrestrial resources technical report. However, a separate discussion of impacts as a result of Project operation was not developed for the DLA.

Adequacy of Applicant's Information

Brown-Headed Cowbird

The DLA provides an adequate discussion of existing conditions, potential Project impacts, and PM&Es for brown-headed cowbirds. However, detailed Project impacts and PM&Es were not included in the DLA.

Bullfrog

The DLA provides a discussion of existing conditions, potential Project impacts, and PM&Es for bullfrogs. However, detailed Project impacts and PM&Es were not included in the DLA.

Bald Eagle

Because bald eagle surveys in the Project area were discontinued in 2003, the information assembled in the DLA does not adequately address bald eagle numbers and important nest and roost sites within and around the Project area.

Big Game and Wildlife Entrainment

The information and “studies” that PacifiCorp used to justify Project impacts on big game movement and wildlife entrainment are inadequate. Therefore, the discussion of Project impacts and the information available to develop appropriate PM&Es is incomplete.

Transmission Line Effects on Avian Species

The information PacifiCorp used to justify conclusions on transmission line effects on avian species is inadequate. Therefore, the discussion of Project impacts and information available to develop appropriate PM&Es is incomplete.

Coarse Woody Debris

PacifiCorp's information on snags and coarse woody debris should be adequate for describing the existing environment and Project impacts and for developing appropriate PM&Es. However, this discussion is missing from the DLA.

Western Pond Turtle

PacifiCorp's information on western pond turtles should be adequate for describing the existing environment and Project impacts and for developing appropriate PM&Es. However, this discussion is missing from the DLA.

Alternative Information and/or Interpretation

Brown-Headed Cowbird

Brown-headed cowbird brood parasitism is a major cause of population decline for some passerine species. Brood parasitism poses a threat to many species by reducing breeding productivity and overall nest success (Mayfield 1977, Brittingham and Temple 1983, Robinson et. al. 1995). Female cowbirds use power poles, power lines, and power towers to scout for host nests (Norman and Robertson 1975,

Thompson and Gottfried 1981). Habitat fragmentation and vegetation management in transmission line rights-of-way, along roadways, or in riparian areas can create edge habitat wherein cowbirds can thrive.

Bullfrog

Still or slow moving waters typical of reservoirs and other impoundments provide highly suitable habitat for bullfrogs. Increases in water temperature resulting from hydroelectric Project operation also allows bullfrog populations to flourish. Bullfrogs are non-native species that have been shown to prey on and reduce population numbers of western pond turtles, foothill yellow-legged frogs, and other native herptiles (Moyle 1973). There is no doubt that bullfrogs have had irreversible effects on native herptile populations within the Project area.

Big Game

It is well known that habitat perturbation can result in negative impacts to big game movements and migrations. Deer and elk migration routes and travel corridors can be interrupted or blocked entirely by reservoirs, canals, or even large road systems. It may be evident that certain individuals are able to quickly adapt to changes in habitat connectivity. However, long-term effects of habitat alteration may include decreased ability of individuals to locate mates, decreased parental investment/involvement with young, decreased ability of individuals to disperse, decrease in fitness, and increase in introduced stimuli that results in elevated predation risk (Frid and Dill 2002, Sutherland and Harestad 2000).

Wildlife Entrainment

The J.C. Boyle canal should be considered an impassible barrier for medium- to small-sized mammals, reptiles, and amphibians and likely stands as a substantial barrier to big game. The Fall Creek, East Side, and West Side canals likely pose some hazard or risk to small nocturnal mammals (e.g., shrews) that are susceptible to exposure.

Transmission Line Effects on Avian Species

Electrocution and collision have and will likely continue to negatively affect avian species that reside in or pass through the Project area. Individuals mortally wounded by electrocution or collision may move from point of impact or may be scavenged and thus go undetected by casual surveys. Electromagnetic fields associated with electric power transmission lines can affect the production of melatonin in birds, potentially resetting their biological clocks and disrupting their migration patterns (Fernie, Bird, and Petitclerc, 1999). The BLM believes it is unreasonable for PacifiCorp to take responsibility for only a portion of the transmission system (e.g., Project lines that constitute 10% of the total transmission system in the area), not for the distribution component of the system, which constitutes 90% of the transmission network.

Coarse Woody Debris

Snags and coarse woody debris within or near the inundation zones have been and will continue to be affected by peaking operations that affect flows in the nearshore and inundation zones of the Klamath River. Average water levels that have been and will continue to be higher than historic levels likely have similar affects on snags and coarse wood. Project roads that have accommodated vehicular access to Project lands have resulted in loss of snags and coarse wood that has been removed for firewood (John Oltoff, pers. comm., 2001).

Western Pond Turtle

Certain segments of the Project, likely the J.C. Boyle full-flow reach, lack suitable basking sites for western pond turtles. This is likely one of the main limiting factors to the presence of pond turtles in the Project area. Peaking operations also have an effect on the suitability of basking sites because peaking operations often dislodge and move logs that occur within the nearshore or inundation zone. Daily drying and inundation is also likely to increase the rate of decomposition of coarse wood, making sites unsuitable for basking.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

Based on our review of the project area, it is likely that Project operations may have negative effects on native passerines and other avian species; herptiles, including western pond turtles; big game; and riparian and wetland areas. Project impacts that benefit parasitic or non-native species, like brown-headed cowbirds and bullfrogs, should be analyzed. Wildlife entrainment and historic and current use of the Project area by big game should be studied further in order that conclusions about these resources can be substantiated. The impact of transmission lines on avian species should be studied and PacifiCorp analysis updated. Unique habitats or features, including riparian and wetland habitats, snags, and coarse wood, should be inventoried and studied further in order to develop a more complete assessment of Project impacts on these resources. Once complete, the results of these analyses should be used to guide development of appropriate PM&E measures that should be included in the final application.

Riparian/Wetland Habitat

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

Discussion of riparian and wetland habitats within the DLA is limited to broad-scale descriptions of riparian resources and plant communities. The information presented lacks the specificity and detail required to assess the existing condition of the environment. There is no substantive discussion of Project impacts. No PM&E measures are proposed.

Adequacy of Applicant's Information

More detailed information regarding the extent, character, and condition of riparian and wetland communities is needed if an assessment of potential Project impacts and PM&Es are going to be developed. Information necessary to evaluate the effects of Project operations on riparian areas should be provided when the riparian/wetland study is complete. Information that is currently lacking includes a detailed vegetation map, assessment of coarse wood, an analysis of the relationship between riparian communities and hydrologic parameters, an analysis of the relationship between riparian communities and substrate, an assessment of willow dynamics, and an assessment of reference conditions and potential future condition of habitat currently inundated by Project reservoirs. In their response to the FSCD, PacifiCorp stated that no mapping or inundated riparian areas would occur. The BLM assumes this statement to be outdated, given discussion of the work group and current text of the riparian/wetland study plan and related draft technical report.

PacifiCorp needs to work with the BLM and other stakeholders to determine the appropriate metrics for analysis. The results of these studies will provide information necessary to assess the effects of Project operations (e.g., peaking operations), a reduced supply of coarse sediment, and the presence of Project reservoirs on the distribution, extent, and character of riparian and wetland communities in the Project area. Study results will lead to development or refinement of PM&E measures.

All elements of study design should be completed prior to submission of the final license application. Study results need to be integrated into the final license application, as they will serve as the basis for discussing riparian dynamics and habitat potential for aquatic and riparian species. Results of riparian and wetland analysis need also to be incorporated into discussions of fish passage and water quality management.

Alternative Information and/or Interpretation

The lack of timely study results constrains the BLM in their ability to assess the effects to Project operations. The BLM requests that all data collected and/or used for analysis be presented to BLM staff for review and interpretation prior to submission of the final license application. Specific requests for information follow.

Existing Environment and Project Impacts

The DLA describes impacts to riparian areas caused by non-Project-related activities (e.g., grazing and recreation) but fails to describe the impacts of Project operations as required by 18 CFR 4.51(f)(3). While the impacts from grazing and recreation are noteworthy and provide a basis for determining cumulative effects, a thorough discussion of Project impacts is required and should be the focus of this session. There are numerous potential effects related to Project operations that are not adequately addressed in the DLA.

Peaking Operations

Flow fluctuations caused by operation of the J.C. Boyle powerhouse can result in daily inundation and exposure of nearshore areas along the 16-mile J.C. Boyle peaking reach. The width of “varial zones” created by flow fluctuations are on the order of 10 to 15 meters wide in the low gradient portions of the peaking reach.¹⁰ In steeper portions of the peaking reach, the varial zone is much narrower and is confined to the inundation zone and nearshore areas. Daily high flows in the peaking reach likely impair or prevent establishment of riparian hardwoods (such as willow and cottonwood) by flushing seeds and seedlings downstream and creating soil oxygen conditions that are unsuitable for establishment of these and other species (Scott et. al. 1993). Peaking operations also affect the relationship of invasive species, like reed canary grass, which forms large monotypic patches along the peaking reach. Such species likely benefit from unstable conditions that result from frequent, and often extreme, water level fluctuations (Conchou and Fustec 1988, Guard 1995, and Antieau 2000).

The relationship between flow regimes and riparian plan communities has been noted by many researchers working in the western United States and elsewhere. A subject of recent interest is examining natural flow regimes and the relationship of flow alteration to restoration and enhancement potential (Poff et. al. 1997, Stromberg 2001, Scott et. al. 1996, Auble et. al. 1994, Scott et. al. 1993, Pettit et. al. 2001).

Ramping

Project operations in the J.C. Boyle peaking reach cause rapid changes in water surface levels and consequent fluctuations in the water table in nearshore areas. The current ramping rate at the J.C. Boyle powerhouse (9 inches per hour, as measured at USGS gage 11510700) is much greater than the rate at which the root systems of riparian plants can grow.

¹⁰ Riparian/geomorphology presentation to CH2MHill. Bureau of Land Management. June 2003.

Sediment Recruitment

The trapping of sediments behind dams resulted in a reduced supply of fines in areas downstream of Project facilities. As noted by Scott et. al. (1993), “germination and establishment [of riparian hardwoods] typically takes place on *freshly deposited alluvium* in channel positions low enough to provide adequate moisture but high enough to escape scour...” The loss of silts, sands, and gravels in streamside substrates has resulted in nearshore areas dominated by coarse gravel and cobble that are less suitable for establishment of woody riparian species.

Dispersal Barriers

Project dams and reservoirs likely influence the dispersal of plant propagules. This impact is not being assessed as part of the riparian/wetland analysis, but has been documented in other regulated systems (e.g., Tabacchi et. al. 1996, Jansson et. al. 2000).

Landscape Level Alterations

Project features may cause landscape scale changes in the distribution of riparian/wetland vegetation. This hypothesis is supported by a review of the vegetation mapping data and GIS layer developed by PacifiCorp for the DLA. Riparian/wetland areas located on the margins of Project reservoirs differ from riverine wetlands in numerous regards. Likewise, there are apparent differences between the J.C. Boyle bypass reach and the physiographically similar “Caldera” reach between Frain Ranch and the Oregon-California border.

A comparison of riparian communities adjacent to J.C. Boyle Reservoir and the Klamath River between J.C. Boyle dam and Caldera Rapid illustrate some of these differences (Table III-6). Compared to the river, riparian/wetland vegetation along the reservoir margins is low in species diversity, is spaced at greater intervals along the reservoir shoreline, and is dominated by herbaceous species. In contrast, riverine/riparian communities have higher species diversity and include more shrubs and trees.

	J.C. Boyle Reservoir			Klamath River from J.C. Boyle Dam to Caldera Rapid		
Approximate Shoreline Length (km)	12.4			35.0		
Vegetation Type	Number of mapped units	Total Area (ac)	Mapped Units per Kilometer	Number of mapped units	Total Area (ac)	Mapped Units per Kilometer
Palustrine Emergent	16	62.5	1.3	9	4.5	0.3
Palustrine Forested				1	5.0	0.0
Riparian Grass	2	0.9	0.2	60	27.9	1.7
Riparian Shrub				31	20.0	0.9
Riparian Deciduous				11	11.9	0.3
Riparian Mixed				1	0.4	0.0
All Mapped Palustrine/Riparian Units	18	63.4	1.5	113	69.7	3.2

Table III-6. Comparison of riparian/wetland vegetation units associated with J.C. Boyle Reservoir, the downstream river reach, based on analysis of vegetation GIS data provided by PacifiCorp.

The distribution of riparian vegetation types is markedly different between the J.C. Boyle bypass reach and the high gradient “Caldera” portion of the J.C. Boyle peaking reach (Figure III-7). Although “Riparian Shrub” communities are common in both reaches, the Bypass reach has a large number of “Riparian Grass” sites and few “Riparian Deciduous” sites, whereas the Caldera sub-reach has very few

“Riparian Grass” sites and many “Riparian Deciduous” sites. The Riparian Grass sites in both reaches are dominated by reed canary grass. Potential causes of these differences include reduced flood frequency in the J.C. Boyle Bypass reach, which allows reed canary grass to thrive, and a more pronounced reduction in sand and gravel, which may also favor the establishment of reed canary grass over that of shrubs and trees. Canal sidecast in the J.C. Boyle bypass reach could also be impacting the distribution of vegetation types.

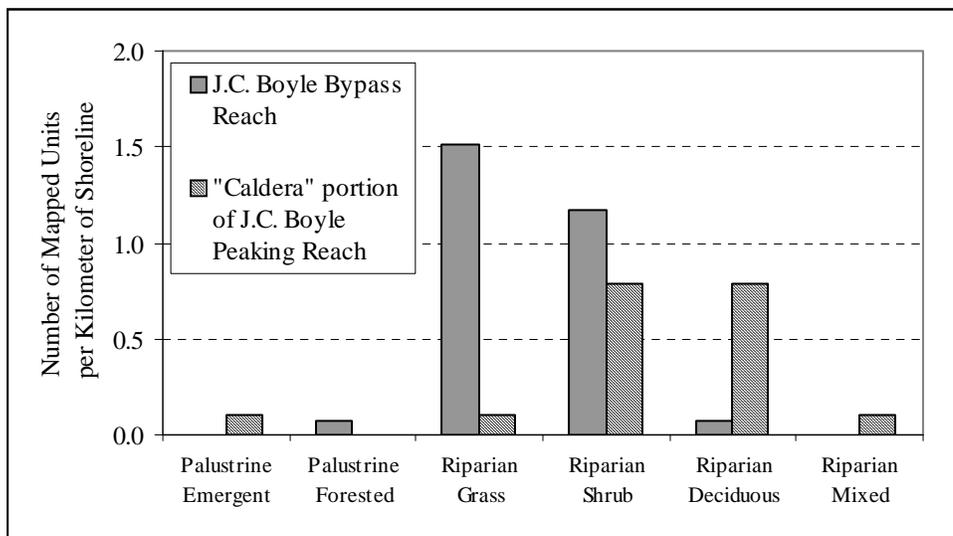


Figure III-7. Comparison of the frequency of riparian/wetland vegetation types in the physiographically similar J.C. Boyle bypass and “Caldera” reaches, based on analysis of vegetation GIS data provided by PacifiCorp.

Continuing Impacts of Project Facilities

Reservoirs and other Project facilities that remain in place over the term of the new license will prevent the exposure of inundated areas that would otherwise recover and eventually support riverine, riparian, and wetland vegetation and provide habitat for various fish and wildlife species. Project reservoirs inundate relatively low gradient river reaches¹¹ that would likely support extensive and diverse riparian communities were it not for the reservoirs. Historic maps presented in Eilers and Gubala (2003) also indicate the relatively high potential for riparian plant establishment in these areas. Despite the BLM’s repeated requests for information specific to inundation of riparian areas, PacifiCorp only recently committed to determine the type and extent of habitats inundated by Project reservoirs. To date, none of this information has been made available.

Other Project facilities that will remain in place over the term of the new license will continue to impair riparian communities in a similar manner. Project facilities occupy approximately 6 acres of BLM-administered land within riparian reserves adjacent to the Klamath River. Riparian reserves are “portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply” (USFS and BLM 1994). These areas are managed to maintain and restore ecological processes and aquatic/riparian habitat. Project operations will continue to impact riparian reserves and limit the BLM’s ability to maintain management objectives for these areas.

Proposed PM&E Measures

As described above, there are many ways in which Project operations are likely to affect or do affect riparian and wetland vegetation communities. However, the lack of information in the DLA makes it

¹¹ Refer to the longitudinal profile in the Water Resources Draft Technical Report.

difficult to assess the magnitude of effects. In the absence of a complete analysis of the affect of Project operations on riparian and wetland areas, and understanding the BLM's responsibility at this stage of the relicensing process, the BLM is proposing PM&E measures in order to assess impacts of Project operations on riparian and wetland areas.

- PacifiCorp should complete Study Plans 2.1 and 2.2, making data and results available to BLM staff and other stakeholders, among them members of the Terrestrial and Geomorphology Work Groups.
- In coordination with members of the Geomorphology and Aquatics work groups, PacifiCorp should develop a Coarse Sediment Augmentation Plan. This proposed PM&E measure is described above with regards to Project effects on river geomorphology.
- PacifiCorp should develop instream flow regimes for the J.C. Boyle bypass and peaking reaches that minimize Project impacts on riparian areas and other flow-dependent natural resources (fisheries, water quality, and wildlife). These flow regimes will be developed in coordination with the Aquatics, Terrestrial, and Recreation Work Groups.
- PacifiCorp should develop a Riparian/Wetland Mitigation Plan (RWMP) that addresses continuing Project impacts to riverine riparian and wetland areas that will be inundated by Project reservoirs or otherwise impaired by Project facilities over the term of the new license. Components of the RWMP should include a description of the extent and type of riparian/wetland areas that will be inundated by Project reservoirs or located beneath Project facilities, a description of areas suitable for mitigation, a description of timelines and funding, a description of management objectives and proposed management actions, and a monitoring plan.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

The DLA does not adequately describe the effects of Project operations on riparian and wetland communities adjacent to the Klamath River and Project reservoirs. Detailed information regarding Project impacts has not been developed. The BLM believes that there are numerous impacts, the discussion of which has been omitted from the DLA. The PM&E measures proposed by the BLM address Project impacts that are likely to occur during the term of the new license.

Cultural Resources

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

The Cultural Resources Draft Technical Report (CR-DTR) contains a framework for discussing the existing environment, Project impacts, and PM&Es. However, PacifiCorp has not completed most of the studies that will address these issues. Archaeological surveys and site condition assessments within the canyon have been conducted, but the results are not available in anything more than summary tables. Other background investigations, such as a Traditional Cultural Properties study (including ethnographic work and discussion on a Traditional Cultural Landscape nomination) and a historic context statement on hydroelectric development also have not been completed. As with most of the CR-DTR, PacifiCorp indicates that the final report will contain this information.

Several issues within the CR-DTR require comment. For example, it states:

“Pending congressional funding authorization, BLM as part of its River Management Plan is taking the lead in planning and implementing a pedestrian survey of properties controlled by BLM” (CR-DTR:3.4 and 4.4.6; see also Exhibit E:6.5.4).

A number of field studies are contemplated in the coming years as part of a long range planning effort within the Klamath River Canyon on lands administered by the BLM. This planning effort has been, and continues to be, separate from PacifiCorp’s FERC Hydroelectric Relicensing Project. The BLM has not and will not assume responsibility for pedestrian surveys or other required fieldwork within an as yet unidentified Area of Potential Effect (APE) within BLM lands. It is PacifiCorp’s responsibility as Project proponent to conduct appropriate field studies to identify potential effects from Project activities. On April 9, 2003, this issue was discussed during a meeting between PacifiCorp (Toby Freeman, Russ Howison), CH2M Hiss (Dr. Jim Bard), and the Klamath Falls Resource Area lead archaeologist (Dr. Tim Canaday). The following week, PacifiCorp instructed its cultural resources contractors (CH2M Hiss and Historical Research Associates, Inc.) to conduct archaeological surveys and site condition assessments on BLM land. Reference to the BLM taking the lead to conduct PacifiCorp’s survey should have been struck from the DLA at that time.

PacifiCorp’s CR-DTR further states:

“At this time, the final Project Area of Potential Effects (APE) has not been formally determined through consultation with the California and Oregon State Historic Preservation Officer (SHPO) or the Yurok Tribal Historic Preservation Officer” (CR-DTR:2-1).

It is imperative that the APE be defined. Per Section 106 of the National Historic Preservation Act, and as outlined in 36 CFR Part 800.4, definition of the APE should have occurred in the beginning stages of the planning process. Without a defined APE, it is extremely difficult to comment on the DLA in any meaningful way.

Adequacy of Applicant’s Information

PacifiCorp’s CR-DTR does not adequately describe current conditions, does not address Project impacts, and does not provide any PM&Es for cultural resources. The CR-DTR is extremely limited in its scope and contains only a framework for addressing relevant research questions. What is included in terms of a research framework appears to be adequate, but without empirical data the research questions cannot be addressed.

Alternative Information or Interpretation

PacifiCorp has not submitted a draft cultural resources technical report identifying potential substantial Project impacts, nor have cultural resources PM&Es been offered. However, existing observations contained within cultural resource survey reports, site forms and monitoring forms provide a basis for developing a framework from which to begin a discussion of substantial Project impacts and PM&Es.

Substantial impacts to cultural resources include: (1) erosion due to the ramping effects of river flow during peak hydroelectric production; (2) recreation activities along the river corridor (including reservoirs); and (3) unauthorized collection, excavation, and/or disturbance of cultural resources.

Erosion due to the ramping effects of river flow during peak hydroelectric production

A number of prehistoric and historic sites are known to exist immediately adjacent to the Klamath River. Discussions during Cultural Resources Work Group (CRWG) meetings regarding survey results in these

areas suggest that many more newly discovered sites have been documented. Many of these sites have been damaged through stream bank erosion processes. Sites which extend to the rivers edge are particularly susceptible to erosion during periods of peak flows for hydroelectric production. For instance, Site 35KL22 is located within the Klamath River Canyon along the rivers edge. This site includes the remains of a pit house village dating to about AD 1600 based on diagnostic artifacts and a single radiocarbon date. As recently as 1999, river bank erosion to this site had occurred exposing human remains. Emergency bank stabilization along a small section of the river bank by the BLM has temporarily halted the adverse effects of the erosion though additional future stabilization may be required.

Potential PM&Es

- Identify those sites that have already been, or could potentially be affected by river bank erosion
- Determine National Registry of Historical Places (NRHP) significance of each affected or potentially affected site
- Prepare a cultural resources management plan for Project affected areas
- Stabilize archaeological sites by placing rip rap along those areas affected or potentially affected by river bank erosion
- Monitor the effectiveness of the stabilization effort
- Reduce peak hydroelectric production flows

Recreation Activities

Recreation activities such as white water rafting, boating, fishing, camping, hunting, and sightseeing have brought increasing numbers of people in direct conflict with cultural resources within the Project area. These individuals often utilize PacifiCorp property and/or access roads during their recreational activities. For instance, cultural resource sites are being affected by campers inadvertently disturbing sensitive archaeological deposits through the construction of fire rings, leveling areas for tent deployment, burying garbage, or digging temporary latrines. Wave action by boaters on the reservoirs and the upper portions of the Klamath River cause erosion problems similar to that described within the Klamath River Canyon during peak hydroelectric production. Within the Klamath River Canyon, OHV enthusiasts are severely affecting archaeological sites. At site 35KL18, a prehistoric pit house village that was variously occupied between about 5000 BC and AD 1250, OHV use has had particularly devastating effects. The remains of pit houses at this site are being used as “jumps/ramps” by OHV enthusiasts with the result that a number of the pit houses are being severely damaged.

Potential PM&Es

- Identify those sites that have already been, or could potentially be affected by recreational activities
- Determine NRHP significance of each affected or potentially affected site
- Prepare a cultural resources management plan for Project affected areas
- Stabilize archaeological sites affected by recreational activities by capping appropriate portions of the sites with imported fill dirt (for instance at site 35KL18 the affected pit houses could be protected by placing imported fill dirt within the pit house depressions thereby precluding their use as jumps/ramps by OHV enthusiasts)
- Monitor the effectiveness of the stabilization effort
- Increase law enforcement presence in areas known to contain substantial cultural resources and high levels of recreational use

Unauthorized collection, excavation, and/or disturbance of cultural resources

The unauthorized collection, excavation, and/or disturbance of cultural resources within the Project area are well-documented. Existing site records and cultural resources survey reports discuss this problem in detail. Although the results of the current surveys conducted in support of the PacifiCorp relicensing effort have not been made available to the CRWG, discussions concerning on-going looting problems have frequently occurred. For instance, during the surveys along the Klamath River and adjacent to Keno, J.C. Boyle, and Copco Reservoirs, PacifiCorp lowered the pool levels so that the cultural resources survey crews could inspect the ground. The lowering of the pool levels exposed archaeological sites and brought out an extraordinary number of artifact collectors. The cultural resources survey crews reported to the CRWG that artifact collectors were constantly seen along the draw-down zones scouring the area for artifacts. Law enforcement personnel were notified, but when they arrived to investigate, the collectors had already disappeared. Similar lowering of pool levels by PacifiCorp routinely occurs when hydroelectric facility maintenance is required. Looting of archaeological sites above the draw-down zones occurs frequently as well as noted on existing site forms and monitoring reports. This especially occurs at sites located near access roads, campgrounds and areas of high visitor use.

Potential PM&Es

- Identify those sites that have already been, or could potentially be affected by unauthorized collection, excavation and/or disturbance
- Prepare damage assessments of affected sites
- Determine NRHP significance of each affected or potentially affected site
- Prepare a cultural resources management plan for Project affected areas
- Conduct law enforcement surveillance at recently affected sites
- Increase law enforcement presence in areas known to contain substantial cultural resources and high incidences of illegal looting activity
- Design a public relations campaign to educate the public about the importance of protecting cultural resources and the penalties that could be imposed on violators

Alternative Information and/or Interpretation

Since PacifiCorp has not submitted any PM&Es or a draft technical report containing Project impacts to cultural resources, it is not possible to offer alternative interpretations at this time.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

PacifiCorp's CR-DTR is lacking in almost all pertinent areas. PacifiCorp has not identified any APEs, they have not completed the studies required to identify Project impacts, and they have not identified cultural resource PM&Es. PacifiCorp continues to state that the BLM will take the lead for conducting archaeological surveys on BLM land within the Klamath River Canyon.

Recreation Resources

Introduction

The Recreation workgroup has been working collaboratively since its inception. The study development, interpretation of results, and discussion of possible PM&E measures have been productive. The BLM would like to take this opportunity to reiterate our position on issues important to our management.

Proposed FERC Boundary

The proposed boundary eliminates the J.C. Boyle Powerhouse Road from the powerhouse to the Frain Ranch river crossing on the northwest side of the river and continues on the southeast side of the river to intersection with the Topsy Road. This road is the main transportation route in the area and will require an integrated maintenance plan. It is still unclear if the old powerhouse site is still in the proposed license and what plans are for the site.

J.C. Boyle Reservoir

There is a need for a coordinated management plan for reservoir site development that addresses provision of a reliable potable water supply at Topsy Recreation site, additional camping and day use facilities, and operation and maintenance of recreation developments.

Klamath River Bypass Reach

There is a need for improved boater access for utilizing spill events, better fishing access/trails, improve powerhouse shed site for accessible fishing, a warning system for emergency bypass, and real time flow information.

Hell's Corner Reach

There is a need for accurate, consistent description of flows. This will be used in future studies, future operating scenarios, and planned instream restoration work affecting recreation and WSR ORVs (section 7 analysis). There is also a need for a coordinated recreation development/management/monitoring plan for Frain Ranch, Stateline, trails, and operation and maintenance for river patrols and maintenance.

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

The recreation resources section of Exhibit E substantially meets the requirements in 18 CFR 4.51 (f) (5). PacifiCorp has provided a complete description of the existing conditions, some description of Project impacts, and a description of existing and some proposed PM&E measures.

Adequacy of Applicant's Information

While most of the information is correct, there has been a change of condition at Stateline. It is reported incorrectly that the recreation facilities at the lower use area of Stateline Takeout are in good condition (page 5-22). Conditions at this site have deteriorated since the site inventories were completed.

Alternative Information and/or Interpretation

Affected Environment and Project Impacts

Existing OHV use on PacifiCorp and other private lands surrounding J.C. Boyle Reservoir, especially in the Spencer Creek and Chase Mountain areas, warrant consideration of expansion of Sportsman Park to include an OHV/Motocross trail network to meet existing demand. If additional roads are closed to OHVs in the Frain Ranch area, a trail network is needed to meet this displaced demand. PacifiCorp states that these activities are unrelated to the Project and are not to be assessed as part of the study plan (page 5-33). Many of these activities are a direct result of user access to shoreline or other Project lands due to Project-related roads, attractions, and facilities (page 5-151).

Contrary to information in the DLA, PacifiCorp states that use levels at Pioneer Park East and West are low and visitor survey results do not mention motor boating/waterskiing (page 5-124). Weekend use of Pioneer Park west site is often crowded (PacifiCorp states the likely approaching capacity on page 5-64), with picnickers and motor boaters using the unimproved boat launch for water skiing.

It is incorrectly stated that the campground at the Topsy Recreation Site has full hookups (page 2-125, 5-20). Also, the site receives some day use from walk-in and boat-in users during the off-season, after the site is officially closed (corrections needed to table 3.7-36 and page 5-125).

This site may be reaching peak season occupancy on weekends much sooner than PacifiCorp estimates (2031). Personal communications with Topsy's on-site park ranger have indicated that the site has reached capacity most weekends this season (2003), frequently filling before the weekend. Signs placed on Highway 66, along with increased public recognition of the improvements at Topsy, appear to be drawing in additional/repeat visitors.

It is incorrectly stated that OHV activities in the vicinity of Frain Ranch are unrelated to the Project and would be occurring with or without the Project (page 5-5). Project roads have provided access to the Frain Ranch area since the 1970s and associated impacts from uncontrolled OHVs are a direct result of this access.

PacifiCorp accurately states that "in most years, most days provide at least one turbine of flow (at least 1,400 cfs) for several hours at some point in the day, but timing of peaking flows has changed in recent years" (page 2-28). Figure 2-75, page 2-30, clearly shows how the flow releases have changed since 1995. Lower flows are inherently less safe for whitewater boaters, increasing the risk of passengers falling out of the boat as rafts hit exposed rocks (page 2-72). Later releases may be affecting the ability of outfitters to run two-day trips (pages 2-74 and 75). The quality and timing of the trip has also changed with peaking flows shifted to later in the day (pages 2-75 and 76). These effects of timing, duration, and amount of scheduled releases can create major scheduling problems and probable financial impacts for commercial outfitters. Private boaters and fishermen are likely less impacted by the shift in scheduling, as their ability to adapt to these changes is inherently greater.

Proposed PM&E Measures

PacifiCorp should initiate development of a coordinated recreation management plan that provides an overall framework for development and management of recreation facilities. Recreation work group and private landowners in the vicinity of the Project should be integrally involved in development of this plan. The plan should address the following elements:

- Operation and maintenance of existing recreation facilities, including litter removal, sanitation, and restoration of heavily impacted areas.
- Possible future development, expansion, or improvement of recreation facilities, including additional day use or camping areas, parking areas, fishing access points, boat launches, toilets, fire rings, picnic tables, changing rooms, potable water supplies, use monitoring, etc.
- Roads and access, including possible replacement/construction of bridges in the J.C. Boyle reaches, maintenance or improvement of access roads, dust abatement, decommissioning of excess roads, etc.

- Possible non-motorized and motorized trails, including trailhead parking and signage, river scouting trails, trail networks for use by hikers, bikers, and equestrians, trail construction and maintenance, etc.
- Management of OHV use, including management of existing use, possible development or expansion of OHV opportunities (including play areas), and restoration of areas damaged by OHV use.
- Vegetation management and landscaping in the vicinity of recreation facilities, including possible planting, installation of vehicle barriers, and fuels reduction.
- Possible interpretive and educational sites, including signs at portals and destinations.
- Safety and law enforcement, including Sheriff and Marine Patrols, park rangers, communications, and overflow spillway sirens in the J.C. Boyle bypass reach.
- Seasonal caretakers at high-use recreation sites.

The plan should address management of existing recreation facilities, including the following: Sportsman's Park, Pioneer Park East and West, Topsy Recreation Site, Frain Ranch, J.C. Boyle bypass reach fishing trails, the Upper Klamath River Boater Access, the Klamath River Campground, unnamed dispersed sites, the Stateline Raft Takeout, and fishing access sites in the California portion of the J.C. Boyle peaking reach. The plan should also address maintenance of Topsy Road and the Powerhouse Road (from J.C. Boyle powerhouse to Frain Ranch). Objectives of the plan should include meeting existing and future demand for recreation opportunities consistent with comprehensive resource management plans, providing ADA-accessible facilities, and developing funding adequate to operate and maintain recreation facilities. The plan should be developed within the context of regional recreation planning.

In coordination with the Aquatics, Water Quality, and Terrestrial Work Groups, PacifiCorp should develop an instream flow regime adequate to support recreational use and visual resources in river reaches downstream from Project facilities. This flow regime should consider the timing, duration, frequency, and magnitude of flow releases in all river reaches affected by Project operations. Bypass reach flows could be enhanced (via releases from the dam) to allow for boating this reach along or as part of extended float trips through the Hell's Corner run. Year-round base flows in this reach could be increased to enhance scenery by covering up the river bottom and provide adequate aesthetics for general recreation (DTR page 2-55). Increased flows in the J.C. Boyle bypass reach would serve to enhance the recreation ORV for the Upper Klamath Wild and Scenic River.

As part of the development of flow regimes, PacifiCorp should develop a schedule of flow releases that can be used for planning boat trips. The BLM would also like PacifiCorp to continue its toll-free flow phone and web site flow information. Accurate flow information and projections should continue to be made readily available with instantaneous Internet access and flow phone updates. Other enhancements in reliable flow forecasts would assist commercial outfitters in scheduling trips. A standardized reporting method should be implemented to reduce confusion regarding total river flow (base flow plus hydropower releases, discussed on DTR-2-67). PacifiCorp may want to consider displaying the USGS flow gage information on its website to provide more accurate flow information to reflect any operational or inflow changes.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

The DLA provides an accurate description of the existing environment and Project impacts except for where noted above. The PM&E measures proposed by the BLM provide a framework for management of existing recreation sites, developing new recreation sites, and managing instream flows to best meet the objectives of comprehensive management plans.

Land Management and Aesthetics

DLA Discussion of Existing Environment, Project Impacts, and PM&Es

The DLA describes the existing plans appropriate to the Project area. The Medford District Resource Management Plan (RMP) is inappropriately described as not applicable to the relicensing process. There are no PM&E measures proposed and possibly none appropriate for this section.

Adequacy of Applicant's Information

The DLA fails to incorporate the Medford District RMP as a necessary plan to consider in this relicensing. The DLA also fails to disclose most management objectives, including rehabilitation, enhancement, or restoration. While the Klamath Falls RMP and other plans may focus on healthy forest ecosystems, there is direction for aquatic and riverine resources. These sections are the main focus for consideration in this relicensing.

Alternative Information and/or Interpretation

All information is available in the FERC record of comprehensive plans. The Medford District RMP is an appropriate plan to consider in the relicensing process. The DLA also fails to identify the Project's relationship and possible impact to the Spring Creek diversion.

BLM Conclusions Regarding Existing Environment, Project Impacts, and PM&Es

The BLM asserts that the DLA should list the Klamath Falls Resource Area Record of Decision and RMP, the Redding RMP and Record of Decision, and the Medford District Record of Decision and RMP as land use plans to be assessed in this study. These plans should also be considered by FERC as comprehensive plans which the license should be consistent with.

Socioeconomics

Introduction

The development and documentation in the Socioeconomics section of Exhibit E appears to follow FERC guidance "for smaller Projects with major construction." This will not provide FERC with enough information to do an adequate analysis in their EIS. Exhibit E should contain sufficient information to allow the FERC to prepare an EA or EIS (*Hydroelectric Project Licensing Handbook*, Federal Energy Regulatory Commission, Washington, D.C. April 2001, pages 2-3). Information presented in Exhibit E is limited and does not present a complete picture of the current socioeconomic condition of the Project area. While the technical report expands on the current condition description, it is unclear how the changes in the Project will be displayed and analyzed for effects.

Concerning Exhibit E, Section E9.2: Consultation with Applicable Agencies, Tribes, and the Public, there are some additional points of consideration. The work group had considerable discussion on what should

be included in the studies, but because the decision making process was consensus, some items could not be agreed upon. One of these controversial issues is whether the Link River Agreement should be analyzed in this relicensing process. Many, including the State of Oregon, proposed that it should be, because it is an article of the current license. Another strongly debated issue was the consideration of a with and without Project analysis. This will be the focus of Phase 2, 7.2 High Level Socioeconomics Analysis of the Landscape Options. This will not address the concern the work group had with level of detail. The level of detail will vary by alternative and resource area or work group. A third point of consideration is that the scope was limited to examples of FERC socioeconomic analysis in previous EIS. This was not considered to be an appropriate level of analysis by some members of the work group.

E1A Appendix: Collaboration

PacifiCorp Consultation History

PacifiCorp's consultation history is a very complete and accurate chronology of processes. The BLM agrees that the Klamath Collaborative is at a critical point in the Process. It is important that we continue to work together efficiently with a clear objective and schedule. The ultimate goal of the Klamath Collaborative is to develop the final license articles (due March 2004), including PM&E measures and agency and Tribe recommendations and prescriptions. To accomplish this, the Collaborative must have a clear roadmap over the next few months.

The BLM is proposing that the roadmap focus on the analysis of existing data, model outputs, and reference literature to describe the Project impacts, and then prescribe mitigation for the impact. To accomplish the impact analysis, the workgroups need to work on technical interpretation and analysis of existing data. Since we have the information now, because PacifiCorp collected the data without finalized studies, we can proceed with impact analysis.

While the Collaborative is currently committed to all five phases of the Klamath Collaborative Process, the BLM believes there is no time to do them all and can not commit to any decision making structure without the development of a time limited schedule. The BLM proposes a focus on Phase 3: Review Study Results and Interpret the Data Collected. As stated in the Klamath Collaborative Process, "Prior to commencing settlement agreement negotiations, this Protocol will be revised to address the particular needs of that phase" (Klamath Collaborative Process, September 2002, page 7). The BLM will contribute to a discussion with the Collaborative if we determine that the process is adequate to start discussions of negotiated license articles.

E-1A Appendix: Consultation Record

While the BLM understands consultation correspondence can be narrowly defined to only include correspondence that concerns the first or second stage consultation process, we would like to submit the following correspondence for the administrative record. These correspondences are available at the following locations, and possibly from PacifiCorp:

- FERC, FERRIS: Federal Energy Regulatory Records System
Website: <http://www.ferc.gov/Ferris.htm> website
- Lakeview District BLM Office
1301 South G Street
Lakeview, OR 97630

BLM Correspondence to PacifiCorp and FERC:

1. Letter dated November 15, 2002 addressed to Todd Olson, Licensing Project Manager, of PacifiCorp from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Comments on Geomorphology Study**)
2. Letter dated August 21, 2002 addressed to the Secretary of Federal Energy Regulatory Commission from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**Copy of comments on Geomorphology Study**).
3. Letter dated April 26, 2002 addressed to Harry T. Hall, Regional Engineer of Federal Energy Regulatory Commission Portland Regional Office of Energy Projects Division of Dam Safety and Inspection from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**Resource damage due to emergency spillway discharge**).
4. Letter dated July 6, 2001 addressed to David Boergers of Federal Energy Regulatory Commissions from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Notice of public technical meeting, TANGO**).
5. Letter dated May 31, 2001 addressed to Todd Olson, Licensing Project Manager, PacifiCorp from Teresa Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management. (**RE: Authorization of Studies Conducted on BLM Administered Land**).
6. Letter dated March 15, 2001 addressed to Randy Landolt of PacifiCorp-Hydro Resources from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management. (**RE: Recreational Flows**).
7. Letter dated February 21, 2002 addressed to Todd Olson of PacifiCorp from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Comments on Second Draft Study Plans, 1.7, 1.8, 1.9, 1.10, 2.2, 4.2 and 6.5**).
8. Letter dated February 1, 2002 addressed to Todd Olson of PacifiCorp from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Comments on Second Draft Study Plans, 1.3, 1.5, 2.3, 2.4, 2.7, 2.9, 3.4, 5.1, 6.1, 6.2, 6.3 and 6.4**).
9. Letter dated December 18, 2001 addressed to Todd Olson PacifiCorp from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Response to Second Draft Study Plans, 1.1, 1.2, 1.4, 1.6, 1.11, 2.1, 2.5, 2.6, 2.8, 3.1, 3.2, 3.3, 3.5 and 4.1**).
10. Letter dated August 7, 2001 addressed to Todd Olson, PacifiCorp from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Response to Second State Consultation Document**).
11. Letter dated April 21, 2001 addressed to David Boergers of Federal Energy Regulatory Commission from Barbara Machado, District Hydrologist, Lakeview District of the United States Department of the Interior, Bureau of Land Management (**RE: Add to mailing list**).
12. Letter dated March 23, 2001 addressed to David Boergers of Federal Energy Regulatory Commissions from Teresa A. Raml, Manager, Klamath Falls Resource Area of the United States Department of the Interior, Bureau of Land Management (**RE: Response to First Stage Consultation Document**)

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List of Preparers

Barbara Machado	Team Leader
Don Hoffheins	Planner
Kristi Albertson	Writer/Editor
Lou Whiteaker	Botanist
Michael Limb	GIS Coordinator
Michael Turaski	Hydrologist
Robert Roninger	Wildlife Biologist
Rosemary Mazaika	Oregon State Office Water Program Manager
Scott Senter	Outdoor Recreation Planner
Scott Snedaker	Fisheries Biologist
Timothy Canaday	Archaeologist

Appendix A: Klamath Falls Resource Area Management Plan (1995)

The Klamath Falls Resource Area Resource Management Plan (KFRMP) provides:

- Management direction applicable to all land use allocations and resource programs.
- Management direction for specific land use allocations.
- Management direction specific to resource programs.

Management Direction Applicable to All Land Use Allocations and Resource Programs

Activities planned within the resource area must implement direction in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (ROD) and the *Record of Decision for Amendment to the Survey and Manage, Protection Buffer, and Other Mitigating Measures Standards and Guidelines* (S/M ROD). Specifically, proponents need to implement survey and manage provisions and provide protection buffers for specific species.

Management Direction for Specific Land Use Allocations

Riparian Reserves

A significant role of the S/M ROD was implementation of the Aquatic Conservation Strategy (ACS). The ACS includes four key elements:

1. Managing riparian reserves
2. Managing key watersheds
3. Completing watershed analyses
4. Performing watershed restoration

All of these may be necessary for FERC relicensing. Riparian reserves were identified in the KFRMP as a major land use allocation.

Riparian reserves are defined as lands along streams and unstable and potentially unstable areas where specific standards and guidelines apply to most all potential land uses. This can further be described as covering the portions of a watershed required for maintaining hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing water bodies, such as lakes and ponds, wetlands, streams, stream processes, and fish habitats. The objective of riparian reserves is to maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management.

Appendix F of the Final KFRMP and Environmental Impact Statement directs the BLM to consider the following issues for proposed hydroelectric Projects under the jurisdiction of the Federal Energy Regulatory Commission (FERC):

1. Maintaining instream flows and habitat conditions, and maintaining or restoring riparian resources and stream channel integrity.
2. Locating proposed support facilities outside of riparian reserves, 3) ensuring Aquatic Conservation Strategy Objectives are met.
 - Key Watersheds – An important component of the ACS is management of Key Watersheds. This is a management tool, not a land allocation. Spencer Creek, which drains into J.C. Boyle reservoir, was identified as a Tier 1 watershed. Tier 1 watersheds were selected for directly contributing to at-risk anadromous salmonid, bull trout, and resident fish conservation. Specific recommendations from the Spencer Creek Watershed Analysis may affect the conditioning of the FERC license. Jenny Creek was also identified as a Tier 1 Key watershed. As the creek is mostly in the Medford and Redding Resource areas, it is discussed under management direction for those areas.

Late-Successional Reserves/District Designated Reserves

Within the Klamath Falls Resource Area, there are no specific Late-Successional Reserves (LSRs). However, through direction in the NFP, a number of Late-Successional/District Designated Reserves have been identified. The Topsy DDR is directly adjacent to the river drainage within Segment Two. Operation and relicensing of PacifiCorp's facilities could affect this DDR depending on plans for managing roads (Topsy Road) and power lines.

Matrix Lands (General Forest Management Areas)

Those lands within the ROD that are not in one of the other six categories are called Matrix lands. These are the areas where most of the timber harvest occurs, although Matrix lands also include non-forest areas and forest areas unsuitable for timber production. In the relicensing Project, Matrix lands could be affected by road use and power line management. The Klamath River canyon is managed as Matrix, but it has been identified as an Area of Critical Environmental Concern (ACEC) (see Special Areas).

Matrix (Late-Successional/District Designated Reserve) Buffers

Some areas in the west side Matrix that surround Late-Successional/District Designated Reserves are designated as buffers. Most of these special restriction areas are in existing old growth stands. These buffers could be affected similarly to the DDRs mentioned above.

Management Direction Specific to Resource Programs

Direction that appears applicable to FERC relicensing is provided here. Refer also to the KFRMP for a more complete understanding of direction for BLM administered lands.

Water and Soils (KFRMP, p. 28-31)

1. See management direction for riparian reserves and Key Watersheds.
2. Comply with state water quality requirements.
3. Comply with state laws and regulations pertaining to the beneficial uses identified by the states and any applicable water quality standards that have been established.
4. Design management practices to comply with Oregon's Antidegradation Policy.

5. Ensure consistency of management activities with the Oregon Water Management Program (Oregon Administrative Rule 340-41).
6. Perform a watershed analysis to provide the mechanism for consideration, incorporation, and implementation of the above into land and water resource management planning.
7. Permit no degradation of water quality if it will interfere with or become injurious to the established beneficial uses of water within those segments of a river designated under the National Wild and Scenic Rivers Act.
8. Protect floodplains and wetlands in accordance with Executive Orders 11988 and 11990.
9. Follow a four-tier approach for land and resource management: regional, physiographic, or river basin, watershed and project level. Under this approach, analysis starts at the watershed level.
10. Evaluate proposed projects for their cumulative effects on water quality, runoff, and stream channel conditions.
11. Manage riparian-wetland areas to protect, maintain, or improve riparian habitat for wildlife and native plant diversity.
12. Achieve riparian-wetland improvement and maintenance objectives through the management of existing uses, wherever feasible.
13. Prescribe management or riparian-wetland values based on site-specific characteristics and settings.
14. Include corrective measures, such as construction of erosion control structures, and control or mitigate activities that may contribute to soil erosion and degradation of watershed condition.

Wildlife (KFRMP, p. 31-34)

1. If necessary to protect primary values, buffer special habitats from surface disturbance.
2. Provide a buffer around known and future nest sites of protected species.

Fish Habitat (KFRMP, p. 35-36)

1. Develop a coordinated recreation management plan to include tributaries of the Jenny Creek watershed.
2. When possible on lands with fish-bearing streams, block ownership.
3. Meet ACS objectives.
4. Maintain or enhance the fisheries potential of streams and other waters consistent with the BLM's Fish and Wildlife 2000 Plan, the Bring Back the Natives initiative, and other nationwide initiatives.
5. Promote the rehabilitation and protection of at-risk fish stocks and their habitat.

6. Propose fish habitat enhancement projects for rainbow and redband trout.
7. Use the watershed analysis process to address at-risk fish species and stocks and their habitat or individual watersheds. Where appropriate, fish habitat enhancement opportunities will be identified through this process or through coordinated resource management plans.
8. Rehabilitate streams and other waters to enhance natural populations of resident fish.
9. Cooperate with Federal, Tribal and state wildlife management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest, and poaching that threaten the continued existence and distribution of native fish stocks inhabiting federal lands.
10. Identify instream flows needed to maintain riparian resources, channel conditions, and fish passage.
11. Protect, manage, and conserve Federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and Bureau special status species policies.
12. Manage for the conservation of Federal candidate and Bureau sensitive species and their habitats so as not to contribute to the need to list and recover the species.
13. Manage for the conservation of state listed species and their habitats so as not to contribute to the need to list and recover the species.

Special Status Species (KFRMP, p. 36-40)

1. Consult/conference with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action which may affect federally listed or proposed species or their critical or essential habitat. Based on the results of consultation/conferencing, modify, relocate, or abandon the proposed action.
2. Coordinate with USFWS, NMFS, and other appropriate agencies and organizations and jointly endeavor to recover Federal listed and proposed plant and animal species and their habitats.
3. Where appropriate opportunities exist, acquire land to contribute to recovery, reduce the need to list, or enhance special status species habitat.
4. Monitor and manage habitats of federally listed or proposed threatened or endangered species as required by law. Prior to any vegetation or ground manipulation, or any disposal of BLM-administered land, conduct a review of the affected site(s) for such plants or animals.
5. For bald eagles—restrict new roads and other management activities within ½ mile of existing and potential nest sites. Protect potential habitat in cliff areas of upper Klamath River Canyon.
6. For Peregrine falcons—provide a buffer of up to 30 acres around known and future sites; survey for presence in potential nesting habitat and cooperate with the Oregon Department of Fish and Wildlife (ODFW) to reintroduce peregrines into the Klamath River Canyon.
7. For Townsend's Big-eared Bat (Federal Species of Concern, BLM Sensitive Species)

- When available, obtain through exchange or other mutual agreement private lands that support bat populations or contain potential habitat. Continue the Salt Caves seasonal habitat closure from May 1 to September 15.
- Buffer current and future use sites up to 20 acres. Restrict management activities within ¼ mile of occupied sites.
- Conduct an inventory of Townsend's Big-eared Bat populations. Minimize detrimental human disturbance in habitat used by the bat. As opportunities arise, obtain through exchange or other mutual agreement private lands with habitat that support Big-eared Bat populations or have the potential for use by the bat.

Special Areas (KFRMP, p. 31-42)

1. Develop site-specific management plans for new special areas as needed. Protect resource values in new areas pending completion of management plans. Management plans will address other possible action such as land acquisitions, use of prescribed fire, and interpretation.
2. Provide the following management for the upper Klamath River—4,690 acres, 11 miles of the Klamath River canyon from rim to rim extending from J.C. Boyle powerhouse to the Oregon-California state line:
 - Maintain, protect, or restore historic, cultural, scenic, fisheries, wildlife populations, and habitat. Not available for planned timber harvest.
 - Limit off-highway vehicle use to designated roads.
 - No developments allowed to enhance the potential for grazing.
 - Mineral leasing subject to no surface occupancy.
 - Not available for hydroelectric development.
 - Manage area for semi-primitive motorized recreation opportunities.

Cultural Resources Including American Indian Values (KFRMP, p. 43)

1. Identify cultural resource localities and manage them for public, scientific, and cultural heritage purposes.
2. Conserve and protect designated cultural resources for future generations.
3. Identify and evaluate Native American traditional use areas requiring protection and management during watershed analysis or site-specific planning.
4. Evaluate cultural resource sites to determine their potential for contributing to public, cultural heritage, and/or scientific purposes. Evaluate the Klamath River Canyon and lands on Bryant Mountain for nomination to the National Register of Historic Places as Archeological Districts.
5. Address the management of cultural resources through watershed analyses and project plans.

6. Develop partnerships with local American Indian Tribes and other interested parties to accomplish cultural resource objectives.
7. Take appropriate law enforcement or other actions when necessary to protect cultural resources. (Such actions may include physical protection measures such as rip-rapping and barrier installations to reduce deterioration.)
8. Consider acquiring significant cultural resource properties for public, cultural heritage, and scientific purposes.

Visual Resources (KFRMP, p. 43-44)

1. Manage all BLM-administered land to meet the following visual objectives for Visual Resource Management Class A areas: retain the existing character of landscapes.
 - Visual Resource Management Class A: All BLM lands within ¼ mile of Topsy, Surveyor, and Gerber developed recreation sites, the Pacific Crest National Scenic Trail, and Spencer Creek. Also, the Klamath River Complex special recreation management area, Miller Creek Canyon, the Upper Klamath Lake viewshed, state scenic waterways and rivers designated Scenic under the National Wild and Scenic Rivers Act will be managed as Visual Resource Management Class A.
2. Manage Visual Resource Management Class A lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Wild and Scenic Rivers (KFRMP, p. 45)

1. Manage designated as suitable segments of the National Wild and Scenic Rivers System by protecting their outstandingly remarkable values. Maintain and enhance the natural integrity of river-related values in designated and suitable river areas.
2. Provide the following types of interim protection from the J.C. Boyle powerhouse to the Oregon-California state line on the upper Klamath River until a river management plan has been completed, exclude timber harvest in the Riparian Reserve, provide Visual Resource Management Class A management in the corridor, and protect the free-flowing values and identified outstandingly remarkable values (recreation, scenic, fish, wildlife, prehistoric, and historic resources, and its value as a Native American traditional use area).

Socioeconomic Conditions (KFRMP, p. 46-47)

1. Contribute to local, state, national, and international economies through sustainable use of BLM-administrative lands and resources and use of innovative contracting and other implementation strategies.
2. Provide amenities (for example, recreation facilities, protected special areas, and high quality fisheries) that enhance communities as places to live, work, and visit.
3. Improve viewing opportunities for watchable wildlife in the Gerber block area, Klamath River Canyon, Topsy recreation site, and other sites as they arise.

Recreation (KFRMP, p. 47-52)

1. Provide a wide range of developed and dispersed recreation opportunities that contribute to meeting projected recreation demand within the planning area.
2. Manage scenic, natural and cultural resources to enhance visitor recreation experience expectations and satisfy public land users.
3. Support locally-sponsored tourism initiatives and community economic strategies by providing recreation projects and programs that benefit both short- and long-term implementation. Continue participation in multi-agency recreation program (public and private) to coordinate and promote recreational development and tourism.
4. Manage off-highway vehicle use on BLM-administered land to protect natural resources, provide visitor safety, and minimize conflicts among various users.
5. Enhance recreation opportunities provided by existing and proposed watchable wildlife areas and national back country byways.
6. Continue to provide non-motorized recreation opportunities and create additional opportunities where consistent with other management objectives.
7. Manage special and extensive recreation management areas in a manner consistent with the BLM's Recreation 2000 Implementation Plan and Oregon-Washington Public Lands Recreation initiative.
8. Provide additional informational, educational and recreational opportunities to enhance visitors' experiences, and increase their knowledge of the use and protection of natural resources, the BLM's land management role, and the responsibility of visitors to public lands. Examples of opportunities could include development of nature of multipurpose trails in the Klamath River Complex Special Recreation Management Area.
9. Continue to operate and maintain developed and semi-developed recreation sites and developed trails as listed below:
 - Klamath River BLM campgrounds
 - Klamath River edge trail
10. Designate developed recreation sites as fire suppression areas (intensive) and fire fuels management areas. These designations will reduce fire hazards and protect investments. Restrictions on fire suppression equipment and activities or minimum impact methods will be required in the following recreation sites and areas: Klamath River Canyon.
11. Manage timber within developed recreation sites for the purpose of removing or topping hazard trees, providing space for additional facilities and activity areas, and providing desired regeneration of the forest canopy.
12. In addition to the 15 developed and semi-developed sites, maintain potential for recreation development in the 35 other sites and 18 other trail locations. Develop potential sites and trails as funding and/or recreation partnerships become available and if development is consistent with other land use objectives and allocations. Maintain or protect the recreation objectives for

development of potential sites and trails by using and/or modifying the silvicultural treatments and harvest designs discussed in the Timber Section. Identify site and trail objectives and issues during watershed analysis or other activity level planning.

13. Pursue mineral withdrawals for existing developed recreation sites and for proposed recreation site when development is approved.
14. Continue to manage and maintain the following existing special recreation management areas:
 - Klamath River Complex Special Recreation Management Area - 7,460 acres will continue to be managed for semi-primitive motorized recreation objectives. Manage the special recreation management area to emphasize whitewater boating, fishing, and camping along the upper Klamath River. Improve and expand state line take-out. Improve scouting trails for the Caldera and Hell's Corner rapids. Manage and maintain Topsy recreation site with camping units for overnight and day use visitors; boat ramp; the rafting put-in, and several primitive camping sites along Klamath River. Continue to follow the cooperative management agreement with the Pacific Power and Light Company for coordinated recreation trail and facility development. Nominate for designation Topsy Road to the National Back Country Byway System. Maintain the Klamath River edge trail for non-motorized use.
 - Evaluate and update the Klamath River Complex Special Recreation Management Area recreation area management plan. Provide fire-safe, approved, and developed group campsites. Improve and provide barrier-free access at the Topsy recreation site and BLM campground in the Klamath Canyon. Pursue development of a cooperative management agreement with Klamath and Siskiyou counties to provide minimum annual maintenance on the Topsy Road. Pursue the development of additional nature or multipurpose trails and an interpretive facility at the powerhouse site.
15. Designate the majority of BLM-administered land limited to off-highway vehicle use.
16. Off- highway vehicle use will be limited to designated roads and trails in the following sites/areas:
 - Klamath River Canyon ACEC
17. Off-highway vehicle use will be limited to existing roads and trails in the following sites/areas:
 - Lands south of Highway 66, outside of the Klamath River Canyon ACEC.
 - Topsy recreation site
18. Nominate for designation and facilitate the use of the Topsy Road for a new National Back Country Byway. Develop interpretive signs, vehicle parking areas, interpretive brochures, etc. for the Topsy Road Back Country Byway.
19. Design new recreational facilities within riparian reserves, including trails and dispersed sites, so as not to prevent meeting ACS objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within riparian reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of ACS objectives.

20. Adjust dispersed and developed recreation practices that retard or prevent attainment of ACS objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.

Special Products (in Late-Successional/District Designated Reserves) (KFRMP, p. 57)

1. Permit fuel wood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases, these activities will comply with management actions/direction for Late-Successional/District Designated Reserves.

Land Tenure Adjustments (KFRMP, p. 64-65)

1. Meet the following objectives for Zone 1: generally, retain these lands under BLM administration.
2. Manage newly acquired lands for the purpose for which they are acquired or consistent with the management objectives for adjacent BLM-administered lands. If lands with unique or fragile resource values are acquired, protect those values until the next plan revision.
3. Maintain or increase public land holdings in Zone 1 by retaining public lands and acquiring nonfederal lands with high public resource values. The primary mode of acquisition will be through exchange of BLM-administered lands in Zones 2 and 3. Utilize purchases and donations if exchange is not feasible.
4. Consult with county governments prior to any land exchange.
5. Minimize impact on local tax base by emphasizing exchanges rather than fee purchase.
6. Make exchanges to enhance public resource values and/or improve land patterns and management capabilities of both private and BLM-administered land within the planning area by consolidating ownership and reducing the potential for land use conflict.
7. Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and others species at risk of extinction.

Rights-of-way (KFRMP, p. 66-67)

1. Continue to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in this Resource Management Plan.
2. Ensure that all rights-of-way for hydroelectric development are consistent with the Northwest Power Planning Council guidance, which recommends prohibiting future hydroelectric development on certain rivers and streams with significant fisheries and wildlife values.
3. Where consistent with local comprehensive plans and Oregon's statewide planning goals and rules, BLM-administered lands will continue to be available for needed rights-of-way. Utility/transportation routes (for electric transmission, as distinguished from electricity distribution or facilities; pipelines 10 inches in diameter or larger; significant canals, ditches and

conduits; railroad; communication lines for interstate use; Federal and state highways; and major county roads) will be confined to existing and other previously designated corridors.

4. With the exception of buried lines in rights-of-way of existing roads, avoid locating rights-of-way in:
 - Recreation sites (existing and proposed)
 - Areas of Critical Environmental Concern (except Research Natural Areas)
 - Scenic and Recreational Rivers (suitable)
 - Sensitive Species Habitat
 - Visual Resource Management Class II Areas
 - Late-Successional/District Designated Reserves
 - Late-Successional/District Designated Reserve Buffers
5. Remove hazard trees along utility rights-of-way and in other developed areas.
6. Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors.

Access (KFRMP, p. 68)

1. Acquire access to Zone 1 and large blocks of Zone 2 lands when appropriate to manage the resources found there, by obtaining easements, entering into new reciprocal right-of-way agreements, or amending existing reciprocal right-of-way agreements. Condemnation for access will be pursued when necessary.

Roads (KFRMP, p. 71-72)

1. Follow best management practices (see Appendix D) for water quality and soil productivity to mitigate adverse effects on soils, water quality, fish, and riparian-wetland habitat during road construction and maintenance.
2. Specifically address, either in the road management plan or in a watershed analysis, stabilizing existing roads located in drainages, watersheds with water quality limited streams, and or other parts of the resource area where soil/water quality problems are known to exist.

Noxious Weeds (KFRMP, p. 74)

1. Use control methods which do not retard or prevent attainment of ACS objectives.

Fire/Fuels Management (KFRMP, p. 75)

1. Provide appropriate fire suppression responses to wildfires that will help meet resource management objectives and minimize the risk of large-scale, high intensity wildfires.
2. Respond to all wildfires by taking appropriate suppression actions. In most cases, responses will consist of aggressive initial attack to extinguish fires at the smallest size possible.

Appendix B: Redding Resource Management Plan (1993)

Beginning on page 13, the Redding Resource Management Plan (RRMP) provides “Management Guidance.” This guidance consists of discretionary and non-discretionary procedures followed by the BLM. This information is provided for the entire resource area and should be referenced prior to proceeding to Stage II of the relicensing process. Resource area management direction is provided in two parts: “Resource Specific Direction” and “Management Area Direction.”

Resource Specific Direction

Resource area-wide direction is applied to all lands where the specific resources or activities are present. Direction that appears applicable to the FERC relicensing is provided here. Refer also to the RRMP for a more complete understanding of direction for BLM-administered lands.

Cultural Resources (RRMP, p. 14)

1. Comply with the National Historic Preservation Act. Section 106 of the Act (as implemented under 36 CFR 800 and a programmatic Memorandum of Agreement among the California Office of Historic Preservation and the BLM) requires identification and full consideration of any historic or archaeological sites located within a project area or on lands identified to transfer to any non-Federal entity.

Fire Management (RRMP, p. 15)

1. Areas of Critical Environmental Concern, Special Recreation Management Areas, Wilderness Areas, Wilderness Study Areas, Wild and Scenic River Corridors (study and designated), and certain other public lands will require modified suppression techniques to protect the known values.
2. Forest management activities within designated or study corridors of the National Wild and Scenic Rivers System would not be allowed to detract from the outstandingly remarkable values which led to their designation or determination of eligibility.

Hydroelectric and Water Storage (RRMP, p. 17)

1. Potential water power/storage reservoir sites under a land withdrawal will continue to be managed for water power values. Exceptions include withdrawal for water power or storage on streams which become components of the National Wild and Scenic Rivers System, or if public lands are transferred from Federal jurisdiction. In these instances, any existing withdrawals will be recommended for revocation.

Lands and Realty (RRMP, pp. 17-18)

1. All land acquisitions will be through exchange, purchase, or donation. Acquisitions will be from willing sellers for available unimproved property. Available unimproved property is defined in this plan as lands which are willingly offered to the BLM for acquisition and which contain improvements that represent less than 2% of the total value of the land.
2. If only a part of a property is identified for acquisition, and the remaining part would leave the owner with an uneconomic remnant, then the BLM will acquire the entire property as required by

the Uniform Relocation Assistance and Land Acquisition Policies Act of 1970 (PL 91-646, 84 Stat. 1904 Sec 301 (9)).

3. In all acquisitions, the BLM will strive to gain the local support and understanding for the action, especially the support of the Board of Supervisors in the affected county.

Minerals (RRMP, p. 22)

1. BLM interim management of rivers determined eligible for inclusion in the National Wild and Scenic Rivers System will necessitate that a no surface occupancy stipulation be placed on any mineral lease offered within ¼ mile of these rivers. The purposes of this stipulation are to protect the outstandingly remarkable values and maintain the river classification.

Recreation (RRMP, p. 23)

1. ROS prescriptions will be assigned to all public lands within special recreation management areas (SRMAs) and other areas where recreation is a specific resource condition objective (e.g., Upper Klamath and Middle Klamath).

Wild and Scenic Rivers (RRMP, pp. 26-27)

1. The Lower Klamath River is an existing component of the National Wild and Scenic Rivers System. Specific comprehensive river management plans will be written for it, incorporating the decisions made in this RMP and existing resource specific management plans.
2. Forested areas on public land within designated corridors or within ¼ mile of streams determined to be eligible for inclusion in the National Wild and Scenic Rivers System will be managed in a manner that will not detract from the outstandingly remarkable values which led to their designation or determination of eligibility. These forested areas will be managed under the classification of “enhancement of other resources.”
3. The following synopsis provides the preliminary classification(s) for each study stream determined as eligible for inclusion in the National Wild and Scenic Rivers System:
 - Jenny Creek—During their National Wild and Scenic Rivers study, the Medford District BLM found the California portion of Jenny Creek to be eligible for inclusion in the National Wild and Scenic Rivers System and classified as “Scenic.”
 - Klamath River—The Klamath River above Copco Reservoir has been determined to be eligible and suitably eligible for inclusion in the National Wild and Scenic Rivers System as “Scenic.”

Management Area Direction

The study area is within an area designated as the Klamath Management Area (KMA). This general management area encompasses all of the Klamath River drainage within the Redding Resource Area and approximately 25% of the total land base within the entire Redding Resource Area. More specifically, smaller management areas have been delineated for portions of the KMA. These include:

- Upper Klamath River—The portion of the Klamath River corridor from the Oregon-California state line to Copco Reservoir has been determined to be suitable for “Scenic” designation within the National Wild and Scenic Rivers System.

- Jenny Creek ACEC—This Area of Critical Environmental Concern surrounds Jenny Creek from the Oregon-California state line to Iron Gate Reservoir.
- Mid-Klamath River—Along the Klamath River from Iron Gate Dam to the confluence with Cottonwood Creek.
- Shasta and Klamath River Canyon—The portion of the Klamath River canyon from the confluence with Cottonwood Creek to 1.5 miles downriver of the confluence with the Shasta River.

Resource Condition Objectives and Land Use Allocations found on pages 33-36 of the Redding RMP are listed below sequentially for the Upper Klamath River Management Area (Upper Klamath), Jenny Creek ACEC (Jenny Creek), Mid-Klamath River Management Area (Mid-Klamath), Shasta and Klamath Rivers Canyon Management Area (Klamath Canyon), and for the remainder of the Klamath Management Area (Remaining Klamath Area).

Upper Klamath

A. Resource Condition Objectives

1. Maintain the scenic quality of the river corridor.
2. Improve the condition of riparian vegetation to Class II or better.
3. Protect the cultural resources of the river corridor.
4. Improve semi-primitive non-motorized recreation opportunities.

B. Land Use Allocations

1. This portion of the Klamath River is considered eligible and suitable for inclusion in the National Wild and Scenic Rivers System. All public land in the corridor bounded by the northern canyon rim and within ¼ mile of the normal high water along the southern bank will be managed in a manner which will not impair the outstandingly remarkable values and will be consistent with a preliminary classification as “Scenic.”
2. Manage area as semi-primitive motorized.
3. Vehicle use is limited to designated roads and trails.
4. Manage area as Visual Resource Management (VRM) Class II.
5. The river corridor is closed to livestock grazing.
6. Offer public lands with the river corridor for mineral leasing with no surface occupancy.
7. Mineral material deposits are not allowed within the river corridor.
8. Seek administrative transfer of four parcels totaling 520 acres from the Klamath National Forest.

9. Retain existing land (per plan map 1) and acquire available unimproved lands within the area and/or develop cooperative management agreements with Pacific Power and Light or their successors.

Jenny Creek

A. Resource Condition Objectives

1. Protect special status species, i.e. bald eagles and native fish, within Jenny Creek canyon.
2. Maintain the existing scenic quality.
3. Enhance traditional Native American Indian use opportunities.
4. Allow long-term natural restoration of riparian zones to Class II or better.

B. Land Use Allocations

1. Designate the area as a Research Natural Area/ACEC.
2. Manage as semi-primitive motorized.
3. Vehicle use is limited to designated roads and trails.
4. Withdraw area from the available commercial forestland.
5. Withdraw area from mineral entry.
6. Offer for mineral leasing with no surface occupancy.
7. Retain existing land (per plan map 1) and acquire available, unimproved, privately owned lands within Jenny Creek canyon.
8. Close the Research Natural Area/ACEC to livestock grazing.
9. Jenny Creek has been determined eligible for inclusion in the National Wild and Scenic Rivers System, with a preliminary classification as "Scenic."

Mid-Klamath

A. Resource Condition Objectives

1. Maintain existing public lands within the designated Wild and Scenic River Corridor in present conditions

B. Land Use Allocations

1. Establish a corridor for this segment of the Klamath River between Iron Gate Reservoir (River Mile 190) and the Klamath River Canyon (River Mile 181), which consists of the 100-year floodplain within 1/8 mile of normal high water or the nearest paralleling road/railroad, whichever is least. Permit no actions on public land which would impair the quality or condition of this "Recreational" component of the National wild and Scenic Rivers System.

Klamath Canyon

A. Resource Condition Objectives

1. Improve Chinook salmon spawning in the lower Shasta River.
2. Restore riparian vegetation to Class II or better.
3. Enhance non-motorized recreation opportunities.
4. Protect historic and prehistoric resources within the area.
5. Enhance access for traditional uses of the rivers by Native American Indians.

B. Land Use Allocations

1. Establish a corridor for the segment of the Klamath River between River Mile 181 and the Klamath National Forest boundary (approximately 400 feet downstream of the mouth of Ash Creek) that does not exceed ¼ mile above the normal high water mark of this “Recreational” component of the National Wild and Scenic Rivers System. Manage area as semi-primitive motorized.
2. Manage the area as Roaded Natural.
3. Vehicle use is limited to designated roads and trails.
4. Manage future developments outside of public highway rights-of-way as VRM Class II.
5. The river corridor is closed to livestock grazing.
6. Retain existing land (per plan map 1) and acquire available unimproved lands within the area with priority given (in descending order) to unimproved lands within the ACEC, Klamath River corridor, and lands between Interstate 5 and the ACEC.

Remaining Klamath Area

A. Resource Condition Objectives

1. Enhance the ability to acquire high value resource land within the Redding Resource Area by disposal of scattered public land interests with the Klamath Management Area.
2. Enhance the resource management efficiency and public service mission of local, state, and Federal agencies via transfer of specific public lands from the BLM.

B. Land Use Allocations

1. Transfer jurisdiction of 19 parcels of public land encompassing approximately 3650 acres to the Shasta and Klamath National Forests. These parcels include:
 - Agricultural inspection station (T. 39N., R. 1W., NW¼ NW¼ , Section 4)

- Dry Lake (T. 44N., R. 1W., SE¼ SE¼ , Section 31)
 - Goosenest (T. 45N., R. 4W., Section 36)
 - Willow Creek (to include in spotted owl habitat conservation area) (T. 43N., R. 4W., NE¼, Section 36)
 - Pluto Cave (to enhance recreation and protect natural/cultural values) (T. 43N., R. 4W., Section 22)
 - Iron Dyke Mine Owl Habitat Area (T. 48 N., R. 8W., S½ SE¼, Section 22)
 - McGavin Peak (T. 47 N., R. 2W., Sections 4, 6, 8, 18, 0; and T. 48N., R. 2W., Section 32)
 - Butte Valley Land Use Project (T. 4N., R. 1W., Sections 14 and 22)
2. Transfer via exchange, the Recreation and Public Purposes Act (R&PP), or cooperative agreement administrative responsibility of 80 acres within the Butte Valley Wildlife Area (T. 47N., R. 2W., Section 28) to the California Department of Fish and Game.
 3. Transfer via exchange, R&PP, or sale to the County of Siskiyou the Handbook refuse transfer site (T. 47N., R. 6W., Section 29, N½ SE¼ NE¼).
 4. Transfer via R&PP or exchange to the City of Yreka, the County of Siskiyou, or another qualified local agency the Humbug Gulch parcel, encompassing approximately 140 acres (T. 45N., R. 7W., Section 21). Offer for exchange to any party after 2 years from the approval of the Final RMP.
 5. One thousand twenty-five acres near Hawkinsville (T. 24N., R. 7W., Sections 2, 3, 10, and 11) are suitable for the community development purpose of a reservation for federally-recognized Indian Tribe(s). If congressional sponsorship is unavailable, offer for exchange to any party after 5 years from the approval of the Final RMP.
 6. All public land interests not noted above in II A-H (1-5) are available for exchange.
 7. The majority of the available commercial forestland would be managed as restricted.

Northwest Forest Plan Amendment to the Redding Resource Management Plan

Besides the direction for the above management areas, the April 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (ROD or Northwest Forest Plan) created new land allocations. Two of these allocations (Riparian Reserves and Matrix) are applicable in the Project vicinity. The ROD provides stringent standards and guidelines that comprise a comprehensive ecosystem management strategy for the old growth resources covered in these land allocations.

Riparian Reserves

A significant role of the Amendments in the ROD was implantation of the Aquatic Conservation Strategy (ACS). The ACS includes four key elements:

1. Managing riparian reserves

2. Managing key watersheds
3. Completing watershed analyses
4. Performing watershed restoration

All of these may be necessary for FERC relicensing. Riparian reserves were identified in the Klamath Falls RMP as a major land use allocation.

Riparian reserves are defined as lands along streams and unstable and potentially unstable areas where specific standards and guidelines apply to most all potential land uses. This can further be described as covering the portions of a watershed required for maintaining hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing water bodies, such as lakes, ponds, wetlands, streams, stream processes, and fish habitats. The objectives of riparian reserves are to maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management. The width of the riparian reserve along the river is approximately 300 feet on each side of the high water mark.

Matrix Lands (General Forest Management Areas)

Those lands within the ROD that are not in one of the other six categories are called Matrix lands. These are the areas where most of the timber harvest occurs, although Matrix lands also include non-forest areas and forest areas unsuitable for timber productions. In the relicensing Project, Matrix lands could be affected by road use and power line management.

Appendix C: Medford District Record of Decision and Resource Management Plan (1995)

The Medford District Resource Management Plan (MRMP) provides:

- Management direction applicable to all land use allocations and resource programs.
- Management direction for specific land use allocations.
- Management direction specific to resource programs.

Management Direction Applicable to All Land Use Allocations and Resource Programs

Activities planned within the western part of the resource area must implement direction in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (ROD) and the *Record of Decision for Amendment to the Survey and Manage, Protection Buffer, and Other Mitigating Measures Standards and Guidelines* (S/M ROD). Specifically, proponents need to implement surveys, manage provisions, and provide protection buffers for specific species.

Management Direction for Specific Land Use Allocations

Riparian Reserves

A significant role of the S/M ROD was implementation of the Aquatic Conservation Strategy (ACS). The ACS includes four key elements:

1. Managing riparian reserves
2. Managing key watersheds
3. Completing watershed analyses
4. Performing watershed restoration

All of these may be necessary for FERC relicensing. Riparian reserves were identified in the MRMP as a major land use allocation.

Riparian reserves are defined as lands along streams and unstable and potentially unstable areas where specific standards and guidelines apply to most all potential land uses. This can further be described as covering the portions of a watershed required for maintaining hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing water bodies, such as lakes and ponds, wetlands, streams, stream processes, and fish habitats. The objectives of riparian reserves are to maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management. The width of the riparian reserve along Jenny Creek is approximately 300 feet each side of the high water mark. Riparian reserves have also been delineated on Fall Creek, Camp Creek, and Scotch Creek, streams which drain into Iron Gate Reservoir.

- Key Watersheds – An important component of the ACS is management of Key Watersheds. This is a management tool, not a land allocation. Jenny Creek, which drains into Iron Gate Reservoir, was identified as a Tier 1 Key watershed. Tier 1 watersheds were selected for

directly contributing to at-risk anadromous salmonid, bull trout, and resident fish conservation. Specific recommendations from the Jenny Creek Watershed Analysis may affect the conditioning of the FERC license and should be reviewed.

Late-Successional Reserve (LSR)

1. Maintain a functional, interacting, late-successional, and old-growth forest, including the Jenny Creek LSR (MRMP, p. 32).
2. Neither construct nor authorize new facilities that may adversely affect late-successional reserves (MRMP, p. 34).
3. Retain and maintain existing developments, such as campgrounds, utility corridors, and electronic sites consistent with other management actions/direction for LSRs (MRMP, p. 34).
4. Remove hazard trees along utility rights-of-way, trails, and in other designated areas (MRMP, p. 34).
5. Consider land exchanges in LSRs if they provide benefits equal to or better than current conditions (MRMP, p. 34).
6. Consider as valued uses access to nonfederal lands through LSRs and existing rights-of-way agreements, contracted rights, easements and special/temporary use permits in LSRs (MRMP, p. 35).

Matrix Lands (Southern General Forest Management Areas)

Those lands within the ROD that are not in one of the other six categories are called Matrix lands. These are areas where most of the timber harvest occurs, although Matrix lands also include non-forest areas and forest areas unsuitable for timber production. Matrix lands occur primarily on the east and west sides of the Jenny Creek LSR. In the relicensing Project, Matrix lands could be affected by road use and power line management.

Management Direction Specific to Resource Programs

Water and Soils

1. Improve and/or maintain soil and water conditions by closing selected areas to off-highway vehicle use and/or limiting such use to existing or designated roads and trails (MRMP, p. 42).
2. See management direction for riparian reserves and Key Watersheds (MRMP, p. 42).
3. Continue to implement a nonpoint source management program in cooperation with the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality (MRMP, p. 42).
4. Prepare watershed plans in conjunction with and for the City of Yreka community water system where BLM administers a significant portion of land within the watershed (MRMP, p. 42).
5. Ensure consistency of management activities with the Oregon Water Management Program (Oregon Administrative Rule 340-41) (MRMP, p. 42).

6. Identify instream flows needed to maintain riparian resources, channel conditions, aquatic habitat, and water quality. Attempt to acquire or encourage the State of Oregon to acquire instream flow water rights (MRMP, p. 44).

Fish Habitat

1. Meet ACS objectives (MRMP, p. 49).
2. Maintain or enhance the fisheries potential of streams and other waters consistent with the BLM's Fish and Wildlife 2000 Plan, the Bring Back the Natives initiative, and other nationwide initiatives (MRMP, p. 49).
3. Promote the rehabilitation and protection of fish stocks at risk and their habitat (MRMP, p. 49).
4. Use the watershed analysis process to address at-risk fish species and stocks and their habitat or individual watersheds. Where appropriate, fish habitat enhancement opportunities will be identified through this process (MRMP, p. 49).
5. As identified through watershed analysis, rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish...in Jenny Creek (MRMP, p. 50).
6. Except for land tenure Zone 3 lands, riparian and fish habitat will be retained unless land exchanges would improve management of fish, wildlife, or riparian habitat elsewhere (MRMP, p. 50).
7. The BLM would work with the Oregon Department of Fish and Wildlife (ODFW) to determine appropriate streamflows for instream water rights to maintain or enhance habitat (MRMP, p. 50).
8. BLM ownership in the Klamath River Basin—Jenny Creek Watershed would be blocked up where possible to improve watershed management for Federal candidate fish and amphibian species (Jenny Creek sucker, redband trout, and Western pond turtle) (MRMP, p. 50).
9. Consult/conference with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action which may affect federally listed or proposed species or their critical or essential habitat. Based on the results of consultation/conferencing, modify, relocate, or abandon the proposed action (MRMP, p. 52).
10. Coordinate with the USFWS, NMFS, and other appropriate agencies and organizations and jointly endeavor to recover Federal listed and proposed plant and animal species and their habitats (MRMP, p. 52).
11. Where appropriate opportunities exist, acquire land to contribute to recovery, reduce the need to list, or enhance special status species habitat (MRMP, p. 52).

Special Areas

Jenny Creek Area of Critical Environmental Concern (ACEC)

1. Manage previously designated special areas in accordance with approved management plans (MRMP, p. 56).

2. Protect resource values in new areas pending completion of management plans including for Jenny Creek ACEC (MRMP, p. 56-60):
 - Primary Objective: Natural systems, riparian values, special status fish and other special status plants and animals (Jenny Creek sucker and redband trout).
 - Management: Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to no surface occupancy. Acquisition needed.
3. Coordination will occur with the Redding Resource Area in California on the Jenny Creek ACEC and the Horseshoe Range Wildlife Area that are contiguous with the Cascade-Siskiyou Ecological Emphasis Area. This area will be part of a quality management area (QMA) that includes the majority of the Dead Indian Plateau that is under BLM administration. This is an area where greater emphasis will be placed on innovative social processes as a tool for achieving resource objectives through applied stewardship (MRMP, p. 62).

The Cascade-Siskiyou National Monument (CSNM)

The Cascade-Siskiyou National Monument (CSNM) was established on June 9, 2000, when President William J. Clinton issued a Proclamation (Appendix A) under the provisions of the Antiquities Act of 1906 (Appendix B). The CSNM consists of 52,947 acres of Federal land administered by the Bureau of Land Management, Medford District Office. The CSNM is located in southern Jackson County, Oregon, and includes BLM-administered lands in portions of the Jenny Creek and Klamath River-Iron Gate Watersheds in the Klamath River Basin above Iron Gate Dam.

The CSNM was created to protect an array of biological, geological, hydrological, archeological and historic objects. Although important individually, collectively, in the context of the natural environmental processes, these objects comprise a unique, diverse ecosystem. The Proclamation, which is the principal direction for management of the CSNM, clearly dictates that the BLM to manage the Monument to protect the objects identified. All other considerations are secondary to that edict. The guiding principle for management of the CSNM is to protect, maintain, restore, or enhance relevant and important object(s).

A Draft Resource Management Plan/Environmental Impact Statement (DRMP/DEIS) is being prepared for the CSNM by the BLM Medford District Office and is expected to be available for public review in late April 2001.

Recreation

1. Provide a wide range of developed and dispersed recreation opportunities that contribute to meeting projected recreation demand within the planning area (MRMP, p. 63).
2. Manage scenic, natural and cultural resources to enhance visitor recreation experience expectations and satisfy public land users (MRMP, p. 63).
3. Manage off-highway vehicle use on BLM-administered land to protect natural resources, provide visitor safety, and minimize conflicts among various users (MRMP, p. 63).
4. ACECs will be closed or limited to existing roads only, depending on the values of the individual site (MRMP, p. 66).

Visual Resources

1. Manage the BLM-administered land to meet the following visual objectives (MRMP, p. 70):
 - Visual Resource Management Class III areas: partially retain the existing character of landscapes.
 - Visual Resource Management Class IV areas: partially retain the existing character of landscapes.
2. Manage Visual Resource Management Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape (MRMP, p. 70).
3. Manage Visual Resource Management Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture (MRMP, p. 70).

Socioeconomic Conditions

1. Provide amenities (for example, recreation facilities, protected special areas, and high quality fisheries) that enhance communities as places to live, work, and visit (MRMP, p. 80).

Land Tenure Adjustments

1. Meet the following objectives for land tenure adjustments (MRMP, p. 81):
 - Zone 1: generally, retain these lands under BLM administration.
 - Zone 2: block up areas in Zone 2 with significant resource values and exchange other lands in Zone 2 to block up areas in Zones 1 and 2 with significant resource values.
2. Consider land exchanges especially to improve area, distribution, and quality of late-successional reserves where public and private lands are intermingled (MRMP, p. 81).

Rights-of-way

1. Continue to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in this Resource Management Plan.
2. Ensure that all rights-of-way for hydroelectric development are consistent with the Northwest Power Planning Council guidance, which recommends prohibiting future hydroelectric development on certain rivers and streams with significant fisheries and wildlife values.
3. Subject to existing rights and with the exception of buried lines in rights-of-way of existing roads, exclude rights-of-way in ACECs (MRMP, p. 83).

4. For hydroelectric projects under the jurisdiction of the Federal Energy Power Commission, provide timely written comments regarding maintenance to instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity (MRMP, p.83).
5. For hydroelectric projects where existing support facilities inside riparian reserves that are essential for proper management, provide recommendations to ensure that ACS and riparian reserve objectives are met (MRMP, p.83).
6. Retain and maintain existing developments, such as utility corridors and electronic sites, consistent with other management actions/direction for LSRs (MRMP, p.83).
7. Remove hazard trees along utility rights-of-way and in other developed areas (MRMP, p.83).

Roads

1. Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if existing coarse woody debris is inadequate. Consider topping of trees as an alternative to felling (MRMP, p. 87).

Fire/Fuels Management

1. Provide appropriate wildfire suppression responses to wildfires that will help meet resource management objectives (MRMP, p. 89).

Noxious Weeds

1. Use control methods which do not retard or prevent attainment of ACS and riparian reserve objectives (MRMP, p. 93).

COMMENTS BY THE BUREAU OF RECLAMATION, KLAMATH BASIN AREA OFFICE

PacifiCorp, an applicant for re-licensing six hydroelectric power plants and one dam facility on the Klamath River, issued a draft Application Report on the Klamath Hydropower Project in June 2003. The Hydropower Project is identified as FERC 2082. Facilities included in the re-license application are located in the upper Klamath River Basin in both Oregon and California.

The Bureau of Reclamation, Klamath Basin Area Office is responsible for the operations and maintenance of the Klamath (Irrigation) Project, an agricultural development in southern Oregon/northern California. The Project contains three dams, water conveyance facilities and drainage works that facilitate the agricultural use of more than 210,000 acres of land. In addition, the project supports four wildlife refuges containing approximately 159,000 acres of land. There is a synergy between the hydropower and irrigation projects in that they share a common facility, the Link River Dam, a storage and diversion dam. Two of PacifiCorp's hydropower facilities, the East Side and West Side Power Plants, receive their water supply from Link River Dam. Consequently, Reclamation and PacifiCorp have developed a relationship that allows each party to more efficiently use their limited human resources to meet respective responsibilities.

Reclamation is providing these comments on PacifiCorp's draft Application Report based on its Federal Power Act (FPA) authorities, including Section 4(e) as well as its relationship based on agreements and understandings with PacifiCorp in the operations of Link River Dam.

General Comments:

Reclamation's review of the Draft Report was hampered by the incompleteness of the document, as a draft application. There is virtually no information on what PacifiCorp is proposing as a project configuration. Comments made at a number of monthly collaborative meetings lead Reclamation to believe that the new project configuration will not necessarily mimic the current project.

The draft Application Report does not address project alternatives that are being discussed in the collaborative meetings. The Collaborative is developing a System Landscape Option Matrix (SLOM) which is a tool for addressing the possible consequences of five (or more) alternatives, including an existing project alternative. None of the alternatives shown in the SLOM are referenced in the draft application. Without a discussion of PacifiCorp's proposed project it is difficult, if not impossible, to determine the effects each alternative may or may not have on federal resources, making it difficult for Reclamation to fulfill its Section 4(e) responsibilities.

There is little or no specific information on protection, mitigation, and enhancement (PM&E's) measures that will be implemented to support the new hydropower license. Reclamation is currently involved in two initiatives, required by two ESA biological opinions on operation of the Klamath Irrigation Project, that strongly relate to the status of both resident and anadromous fishes in the project area. One initiative, known as the Conservation Implementation Program (CIP), is a broad-based program to address the decline of certain fish species and has basinwide implications in terms of recovery of ESA-listed fishes. The other initiative includes developing

fish entrainment and passage facilities at Link River Dam and project irrigation facilities. It is likely that decisions yet to be made by PacifiCorp will impact how Reclamation will need to proceed in these two initiatives. PacifiCorp needs to display what its proposal is, in order to allow Reclamation to meet its Section 4(e) responsibilities.

Keno Dam and Reservoir is a major facility that is part of the current hydropower license. It is identified in the draft application as “a diversion and re-regulating facility with no generating capability” (see page 2-1). Over the years the reservoir has become important to irrigation interests in the Klamath Basin, particularly those within the federal irrigation project and surrounding non-federal irrigators. Keno Reservoir serves a number of purposes for irrigation. It receives irrigation return flow from both the Klamath basin and Lost River Basin irrigation activities. In addition, a number on non-federal irrigators take their water supply from the reservoir and pump it to nearby lands. Consequently, maintaining historic levels of the Keno Reservoir is important for successful irrigation operations. The draft Application Report acknowledges the existing Keno Dam and Reservoir but does not address whether it will be part of the new license. Alternatives identified in the SLOM do provide for its’ decommissioning. This creates a substantial degree of uncertainty as to what Keno Dam’s future is and, subsequently, how the overall federal resource will be impacted by re-licensing.

Specific Comments:

One of the difficulties in reviewing this report, and providing meaningful comments, is the lack of any specifics. It is recognized that, due to the status of studies, very little meaningful information normally associated with completion of Stage Two activities is available. Coupled with the lack of a clear definition of the proposal, it makes commenting on the specifics of the report, at best, a difficult task with only marginal value. Nevertheless, Reclamation has reviewed the report and provides the following comments. These comments are restricted to those areas of the hydropower project where we have joint interests in the outcome of studies. It must be noted that Reclamation is pleased to have had the opportunity to coordinate closely with PacifiCorp on its proposals and in identifying potential areas of more detailed cooperation. We want to make sure that this close cooperation will continue as we proceed through the final stages of the re-licensing initiative.

Section E2.0 General Description of the Environment

In May 2003 Reclamation announced it was renewing its effort to prepare an Environmental Impact Statement (EIS) that evaluates the effects of operation of Reclamation’s Klamath Irrigation Project through 2012. The EIS effort is driven primarily by two Biological Opinions recently issued by the U.S. Fish and Wildlife Service and the NOAA-Fisheries. The outcome of that EIS effort will likely be new long-term operational criteria of the irrigation project, which could have consequences for the hydropower project. In addition, the long-term operations planning process has a cumulative relationship to the hydropower re-licensing process and should be acknowledged in Exhibit E. Reclamation will develop specific information for its EIS that will likely be pertinent to the final application. Previous work on the EIS developed some early information that is preliminary and limited but there is adequate information available

that, if incorporated into the final application report, could provide value to the licensing process.

Section E4.3.2 Federal Fish Management

The Section concentrates on the roles of US Fish and Wildlife Service and NOAA-Fisheries. Particular emphasis is placed on the two Biological Opinions issued by those resource agencies under the Endangered Species Act. While the responsibilities of the Bureau of Reclamation are identified with regard to the two biological opinions, there is no mention of the Conservation Implementation Plan (CIP) which is a required element of the reasonable and prudent alternative in the NOAA Fisheries BO. Reclamation is actively moving forward with establishment of the CIP and is seeking support of potential program participants. PacifiCorp has been identified as a potential participant. The CIP concept was presented to interested parties, including PacifiCorp, in November 2002 in a public meeting in Klamath Falls, Oregon. Reclamation presented the CIP initiative to the Collaborative Plenary Group during the May 2003 suite of meetings. A draft CIP document describing its goals, objectives and structure was distributed for comment in June 2003. Comments received indicate that significant refinements remain to be accomplished before the CIP can be fully implemented. However, it is Reclamation's view that the CIP will play a central role in coordinating Klamath River basin actions contributing to protection, recovery, and perhaps restoration in some cases, of federally-listed fish and other fish important to the basin's ecosystem. Many of the goals and actions undertaken by of the CIP will address how fisheries can successfully managed in conjunction with hydropower and irrigation facilities in the Klamath Basin. The final Application Report should contain a detailed description of this emerging program and identify to what extent PacifiCorp will be participating in it, as a project PM&E.

Section E4.5.8 Characterization of Resident Fish Entrainment and Turbine-Induced Mortality

The Section discusses a study plan that addresses an effort to characterize resident fish entrainment and mortality at Copco, Irongate, and J.C. Boyle Reservoirs. There is no mention of the need for entrainment and mortality studies in the area of the East and West Power Plants, located off the Link River Dam. Reclamation has recently completed a fish screening project on the "A" Canal, located upstream of Link River Dam, and is now continuing with investigation of similar needs at the dam itself. It isn't clear from the draft Application Report what PacifiCorp plans to do with regard to those two power plants. Entrainment and mortality at the East and West Power Plants have been issues for PacifiCorp. The Oregon Natural Resources Council has recently given notice of intent to sue both PacifiCorp and the Department of the Interior for failure to abide by the federal Endangered Species Act. The suit is directed at fishery losses associated with the operations of those two plants. Any final application report must address how it will respond to entrainment and mortality issues at the East and West Power Plants, assuming they are still part of the proposed project.

Section E9.0 Socio-economics

As currently developed, this section is inadequate in portraying the socio-economic landscape of the Klamath Basin. Two major areas of concern include 1) the importance of irrigated agriculture to the local/regional economy, and 2) the effect that re-licensing will have on either the availability or cost of electric power to support irrigation. Subsection E9.1.1.4 acknowledges that irrigated agriculture is an important component of the area's economy but no specific data is presented to identify the magnitude of its importance. The subsection is inconsistent in that it attempts to estimate (in dollars) the value of recreation and direct employment in the project, but ignores the economic value of agriculture, commercial fishing, or any other economic activity. Under current operating conditions, PacifiCorp provides electric energy to the federal project and rates that are favorable to agriculture. The general consensus is that those rates will be increasing to reflect a more "market-like" environment, with subsequent economic impacts to agriculture users. The concern is that a new rate structure could adversely affect the potential viability of the industry and the integrity of the federal irrigation project.

Reclamation realizes that socio-economic studies have had a difficult time getting underway. However, this section of the application report is probably the most deficient of all the sections and needs substantial improvements to be considered adequate for making Stage Two conclusions.

Conclusion:

PacifiCorp has made substantial progress in its re-licensing application. However, much still needs to be done. At this time, Reclamation cannot make its Section 4(e) determinations based on the information presented, for the reasons stated above. However, we look forward to continuing the close cooperation with PacifiCorp that will allow us to fulfill our statutory obligations.



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Yreka Fish and Wildlife Office

1829 South Oregon Street

Yreka, California 96097

Tel: (530) 842-5763 Fax: (530) 842-4517

September 23, 2003

Mr. Toby Freeman, Hydro Licensing Manager
PacifiCorp
825 NE Multnomah, Suite 1500
Portland, Oregon 97232

Subject: Comments on the Draft License Application for the PacifiCorp Klamath River Hydroelectric Project (FERC No. 2082)

Dear Mr. Freeman:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft License Application (DLA) for relicensing of the Klamath River Hydroelectric Project (Federal Energy Regulatory Commission (FERC) No. 2082) (Project), which is located on the Klamath River in Klamath County, Oregon, and Siskiyou County, California. The Project includes the Fall Creek, Link River East and West Side, Keno, J.C. Boyle, Copco 1, Copco 2, and Iron Gate Facilities.

The purpose of our comments is to ensure that the Final License Application (FLA) contains substantial information, so that the Departments of Interior (DOI) and Commerce can make informed decisions regarding their prescriptive authorities for fishways; so the Service and other parties can develop adequate protection, mitigation, and enhancement (PMEs) recommendations; and so FERC can meet its National Environmental Policy Act (NEPA), Endangered Species Act (ESA), and Tribal Trust obligations, and provide PMEs that will mitigate for the impacts of the Project. The decision of whether to issue a new license, and under what conditions the Project may operate in the future, are critically important to maintaining the cultural, biological, and ecological integrity of the Klamath River Watershed and restoring anadromous as well as resident fishes throughout their historical range.

Service Authorities

We are providing our comments pursuant to our authorities under the Fish and Wildlife Coordination Act (FWCA, 16 U.S.C. 661 et seq.), the Federal Power Act as amended (FPA, 16 U.S.C. 791 et seq.), and the Endangered Species Act (ESA, 15 U.S.C. 1531 et seq.).

Endangered Species Act

Section 7 of the ESA and its implementing regulations (50 CFR § 402.14) require Federal agencies to review their proposed 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 and/or NOAA Fisheries is required. In the case of this Project, the following listed species are or may be present in the Project area and may be affected by operation of the Project: Lost River sucker (*Deltistes luxatus*), shortnose sucker (*Chasmistes brevirostris*), coho salmon (*Oncorhynchus kisutch*), bald eagle (*Haliaeetus leucocephalus*), and northern spotted owl (*Strix occidentalis caurina*). Consequently, section 7 consultation will be required.

Project operations may result in “take” of species listed under the ESA. Section 9 of the ESA prohibits the “take” of any federally-listed endangered or threatened animal species. As defined in the ESA, take means “...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” Take incidental to an otherwise lawful activity may be authorized through section 7 consultation. If a Federal agency is involved with the permitting, funding, or carrying out of the project, then initiation of formal consultation between that agency and the Service pursuant to section 7 of the ESA is required if it is determined that the proposed project may affect a federally-listed species. Such consultation would result in a biological opinion (BO) by the Service and/or NOAA Fisheries that addresses the anticipated effects of the project to the listed species, and that may authorize incidental take.

The Bureau of Reclamation (Reclamation) and PacifiCorp were authorized to take federally-listed suckers during the operation of both irrigation and hydropower projects on the Klamath River under a BO issued in 1996 by the Service. Under a BO issued in 2002 by the Service, which superceded all previous BOs providing incidental take for the Klamath Irrigation Project and the Klamath River Hydroelectric Project, Reclamation was authorized to take federally-listed suckers on the Klamath Irrigation Project. Only Reclamation’s activities were covered under the 2002 BO. Thus, while incidental take by Reclamation is currently authorized for operations at Link River Dam, PacifiCorp’s Klamath Hydroelectric Project, including PacifiCorp’s operations at Link River Dam, is not covered. Listed suckers are currently present in all mainstem Klamath River reservoirs and entrainment and mortality of these fish are likely occurring at each mainstem generation facility. The Service and the DOI have asked repeatedly for entrainment studies below Link River (Service letters of March 27, 2001; December 31, 2002; May 5, 2003, to PacifiCorp; and DOI letter of April 8, 2003, to PacifiCorp). These entrainment studies would quantify take of federally-listed suckers. To date, however, PacifiCorp has declined to conduct such studies. We will soon contact FERC to recommend immediate initiation of section 7 consultation to address both ongoing and future effects associated with the Klamath Hydroelectric Project. In addition, we will recommend that FERC designate PacifiCorp as their representative for informal consultation.

Tribal Trust Responsibilities

The Service has an important trust responsibility to protect the interests of the Native American Tribes in the Klamath Basin. These include the federally recognized tribes such as the Yurok, Karuk, Hoopa Valley, and Klamath Tribes as well as the Resighini Rancheria of California. We are committed to carrying out our Tribal Trust responsibilities, in cooperation with the FERC, to protect the fish, wildlife, botanical, cultural, and historic resources the Federal government holds in trust for the benefit of the Tribes. We also recognize and appreciate the efforts that PacifiCorp has made to include the Tribes in the pre-filing consultation process.

Public Law 99-552 and the Federal Advisory Committee for Restoration of the Klamath River

Public Law 99-552, the Klamath River Basin Fishery Resources Restoration Act (or “Klamath Act”), was adopted by Congress on October 27, 1986, for the purpose of authorizing a 20-year Federal-State cooperative Klamath River Basin Conservation Area Restoration Program for the rebuilding of the River’s fishery resources to optimal levels. The Klamath Act directed the Secretary of the Interior to form the Klamath River Basin Fisheries Task Force (Task Force), a Federal Advisory Committee under the Federal Advisory Committee Act, to provide advice on the recovery of anadromous fish runs of the Klamath River. The 16-member Task Force includes Federal, Tribal, California, Oregon, Siskiyou County, Del Norte County, Klamath County, and commercial and recreational fishing representatives. A Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program (LRP) and Environmental Impact Statement (EIS) for the lower River was completed by the Task Force in 1991 (Enclosure 1). The LRP has been filed with FERC.

The LRP generally directs that fishery restoration is to be achieved through fish habitat protection and fish habitat restoration, from a total watershed perspective, not simply an in-stream perspective. The LRP also advocates that distinct population groups of anadromous fish remaining in the Klamath River be protected from over-harvesting, poaching, or loss of habitat, since each serves as a building block essential to the long-range success of the Restoration Program. Goals, an objective, and sub-objectives of the LRP specific to Klamath River dams and this relicensing are presented in Enclosure 1. Service management goals for the Klamath River are consistent with and complement the LRP goals (Enclosure 1).

Background

The Klamath River was once the third largest salmon-producing watershed on the west coast, supporting large anadromous fish runs that included Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon, steelhead (*Oncorhynchus mykiss*), green sturgeon (*Acipenser medirostris*), and lamprey (*Lampetra sp.*). These runs supported significant commercial, recreational, subsistence, and Tribal harvests. Before Project dams were put in place, fish runs accessed spawning, incubation, and rearing habitat for hundreds of stream miles above Iron Gate Dam, the current limit of upstream passage. The Klamath River watershed also provides

important habitat for a variety of additional fish and wildlife species over which the Service has responsibilities and authorities. As described earlier, several of those species are currently listed under the ESA.

At present, fall Chinook salmon are the only commercially viable run of fish in the Klamath River, with other species at low levels of abundance. Fall Chinook salmon spawn and rear throughout the lower River and are of great importance to in-River recreational and tribal fisheries, ocean and in-River sport fisheries, and commercial fisheries throughout the North Pacific. This stock is also a principal component of the international Pacific Salmon Treaty between the United States and Canada. Steelhead and coho salmon that spawn and rear throughout the lower River are also of economic, recreational, and cultural importance. The outflows from the Project affect virtually all aquatic and riparian habitats and resources throughout the entire 190 miles of lower River.

Beginning in 2000, and throughout the pre-filing consultation process, the Service, NOAA Fisheries, the Tribes, the States of Oregon and California, and other stakeholders have attended numerous meetings and discussions with PacifiCorp. PacifiCorp initiated the FERC licensing process and chose to use the traditional FERC licensing approach. In late 2002, PacifiCorp and many of the stakeholders developed and agreed to use the Klamath Project Collaborative Process Protocol (Process Protocol) which enhanced communication. This group is known collectively as the Klamath Collaborative. The Process Protocol established work groups to focus on technical issues. A Plenary Group was established to serve as the managing body of the Collaborative Process. The assignment and approval of all Collaborative Process studies, work outputs, and all final consensus decisions are the responsibility of the Plenary Group.

The Process Protocol was meant to augment, but not supercede, the duties and responsibilities set forth in the Traditional Licensing Process and identified in 18 CFR § 4.51 and 18 CFR § 16.8. Collaborative participants have proceeded in a two-track process, in which comments have been provided according to the traditional FERC timelines while simultaneously pursuing the Collaborative Process. Specific correspondence from the Service in regard to the Project relicensing is identified in Enclosure 1.

General comments

The DLA is the product of the traditional relicensing process, with ten issues that were identified in the First Stage Consultation Document: 1) Upstream Fish Passage (including potential anadromous fish production in the Upper Basin), 2) Downstream Fish Passage, 3) Water Resources (including hydrology and Project effects on hydrology), 4) Sediment and Geomorphology, 5) Minimum Flows, 6) Ramping Rates/Stranding, 7) Water Quality, 8) Fish Assessment (native trout and wild fish surveys), 9) Terrestrial Resources, and 10) Cumulative Project Impacts. An eleventh issue, Peaking, has been identified and discussed separately in this DLA review by the Service due to its impacts to resources (Description of the Draft Application section of Enclosure 1). The status of relicensing studies related to the eleven issues is provided in the Relicensing Study Status section of Enclosure 1. We appreciate the opportunity to

comment on the DLA, and we recognize the efforts that PacifiCorp has put forward to address the concerns of the Federal, State, and Tribal resource agencies. However, after reviewing the document, we believe the DLA is flawed or inadequate in the following areas. Specific examples are further described in Enclosure 1.

Characterization of the Collaborative Process - The DLA overstates progress made to date in the Collaborative Process. The Collaborative Process has had some positive aspects. However, the Collaborative effort has been misrepresented in some instances and represented selectively in other instances in the DLA.

Continued Inadequacy of Key Relicensing Study Plans - The Collaborative work groups have requested repeatedly that the applicant develop adequate study plans based upon sound science. Despite many months of discussion on nearly all aspects of the studies, several of the key study plans (Fish Passage, Fisheries Assessment, Instream Flows, Effect of Peaking) remain inadequate and/or scientifically unsound. Many of the problems were discussed in the DOI letter dated April 8, 2003. Please reference that letter for more specific information. Service comments on the status of relicensing studies are provided in Enclosure 1. As of the September 2003 Collaborative meeting, seven of the 46 study plans identified by PacifiCorp remain unapproved due to study plan inadequacies. The unfinalized plans are for studies that are critical to the Service's understanding of the impacts of the Project, such as Fish Passage and flow studies. FERC will also need the results from these studies to adequately evaluate the effects of Project in its NEPA and other analyses.

Characterization of Some Studies - The references to "study" or studies are used very loosely in the DLA document. What are characterized as studies are, in several situations, opinions or summaries of available information that should have been presented in Stage 1 of relicensing. The term "study" should be reserved for actual data acquisition and analysis.

Characterization of Basic Information - Section 10(a) of the FPA requires FERC to consider comprehensive plans, where they exist, in their licensing decisions. FERC has already accepted the LRP (Enclosure 1) as a "comprehensive plan" under section 10(a) of the FPA. Therefore, under section 10 of the FPA, FERC is required to consider this plan to the fullest extent practicable at each relevant stage of their licensing process. In addition, FERC must provide equitable treatment for fish and wildlife resources with other Project purposes. The DLA does not acknowledge the LRP, let alone identify any of the substantial conflicts between the operation of existing Project facilities and the goals of the LRP.

Impacts of the Project on Fish and Wildlife Resources - As stated in 18 CFR § 4.51 (f)(3), a discussion of fish, wildlife, and botanical resources in the vicinity of the project and the impact of the project on those resources is required. This report is to be prepared in consultation with the relevant state and Federal agencies. Because the Collaborative Group did not approve key studies due to the inadequacy of study plans, and because other studies have not been completed, there is very little identification of impacts in the DLA. For the same reasons, it is likely that key data will not be provided or analyses completed for inclusion in the FLA. Thus, conclusions

may be based upon inadequate information. We are particularly concerned about the lack of information regarding the effects of the Project on fish passage and water quality. This deficiency should be corrected in the FLA, so that impacts of the Project on fish, wildlife, and botanical resources are clearly identified and discernable from other impacts.

Identification of PMEs - As stated in 18 CFR § 16.8, the DLA is required to provide a characterization of proposed PMEs. However, no PMEs were described in the DLA (Draft Executive Summary, Page 10-1). While it is stated that it is PacifiCorp's intent to work through the Collaborative Process to share study results with the various working groups as they become available, some studies have yet to be approved by the Plenary, and there is no certainty they will be approved or will be conducted. It is PacifiCorp's responsibility to propose PMEs at this phase of the license development and prior to the FLA. We remain available to assist in the development of PMEs.

Information Necessary for FERC to Proceed - Regardless of the ongoing Collaborative Process, the FLA should include information necessary for FERC to meet its NEPA, ESA, and Tribal Trust responsibilities and establish PMEs that will mitigate the effects of the Project. FERC will need to identify a full range of alternatives, but fundamental information needed to evaluate such alternatives has not been provided. The DLA has not identified a preferred alternative or a reasonable range of alternatives. This deficiency should be resolved in the FLA. In addition, the FLA is required to discuss disagreements PacifiCorp has with agency requests and PMEs. Because the DLA has so little substance, the Service is limited in regard to providing technical comments on the development of alternatives, and thus, has a poor understanding of the basis of disagreements.

Conclusion

The Service appreciates the opportunity to comment on the DLA for the Project. We support the Collaborative Process and will work with stakeholders to develop a final application for FERC approval. However, the DLA is inadequate in that it provides no evaluation of Project impacts or PMEs as required by 18 CFR § 16.8. At this time, key studies have not yet been approved by the Collaborative because PacifiCorp's study plans remain inadequate. Without completion of these studies and associated analyses, the Service may have insufficient information from which to draw conclusions, and therefore, will need to be conservative in its recommendations to protect, enhance, and mitigate for the loss of resources.

The FLA is required to fully disclose effects of the Project on the environment; contain adequate information for FERC to meet its NEPA, ESA, and Tribal trust obligations; and provide PMEs that will mitigate for the impacts of the Project. We remain available to assist with FLA development, and request that the time remaining before submittal of the FLA be devoted to promptly approving study

plans that will accurately characterize the Project and its impacts, reviewing study results, and developing the license application, including PMEs. We request that the development of PMEs (including those for Fish Passage, Water Quality, and Flows) in PacifiCorp's Klamath Relicensing Collaborative Roadmap (as presented at the September Collaborative meeting) be prioritized for full discussion at the October 2003 meeting of the Collaborative. If PMEs are not jointly developed at the October meeting, we request that PacifiCorp present their PMEs at the November meeting of the Collaborative and discuss the merits of the PMEs. In this way, the Service and other parties will gain a better understanding of the basis of remaining disagreements.

With respect to FERC's NEPA responsibilities, we request that PacifiCorp provide an equivalent level of analysis for a reasonable range of fish passage, Project operation, and dam removal alternatives that independently and cumulatively assess each Project facility for its upstream and downstream fish passage limitations and potential benefits.

We request that our comments be included in the administrative record as an official statement of our position at this point in the relicensing process.

If you have any questions or concerns regarding our comments, please contact me at (530) 842-5763.

Sincerely,



(for) Phil Detrich
Field Supervisor

Enclosure (1)

CC: John Mudre, FERC, OEP, DHEE, Washington, D.C.
FERC, OEP, DDSI, Portland, OR
Frankie Green, Louis Berger Group, Inc., Sacramento, CA
Bill Bettenberg, DOI, OPA, Washington, D.C
Nolan Shishido, DOI, Office of the Solicitor, Portland, OR
Don Reck, BIA, Washington, D.C.
Estyn Mead, FWS, Region 1, Portland, OR
Jim Stow, FWS, Region 1, Portland, OR
John Engbring, FWS, CNO, Sacramento, CA
Randy Brown, FWS, Arcata, CA
Ron Larson, FWS, Klamath Falls, OR
Bureau of Reclamation, Klamath Falls, OR
Scott Snedaker, BLM, Klamath Falls, OR
Barb Machado, BLM, Lakeview, OR
NOAA Fisheries, Arcata, CA
Steve Edmondson, NOAA Fisheries, Santa Rosa, CA
Annie Manji, California Department of Fish and Game, Redding, CA
Amy Stuart, ODFW, Prineville, OR
Stephanie Burchfield, ODFW, Salem, OR
Larry Duns Moor, The Klamath Tribes, Chiloquin, OR
Hoopa Valley Tribe, Hoopa, CA
Yurok Tribe, Klamath, CA
Karuk Tribe of California, Orleans, CA
Resighini Rancheria of California, Klamath, CA
Ronnie Pierce, Klamath River Inter-tribal Fish and Water Commission, Hoopa, CA

Enclosure 1 to U.S. Fish and Wildlife Service Letter Regarding Klamath Hydropower
Relicensing

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Pages 6-7 Relicensing Study Status

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SERVICE CORRESPONDENCE:

Service Correspondence has been as follows:

1. Letter dated August 8, 2003, addressed to Randy Landolt, Management Director, Hydro Resources Manager of PacifiCorp from Phil Detrich, Field Supervisor of the United States Department of the Interior, Fish and Wildlife Service, Yreka, CA, re: Potential non-compliance of Klamath Project ladders and screens.
2. Letter dated May 23, 2003, addressed to FERC from Phil Detrich, Field Supervisor of the United States Department of the Interior, Fish and Wildlife Service, Yreka, CA, re: Adding the Long Range Plan for the Klamath River Basin Conservation Area Fisheries Restoration Program to FERC's list of Comprehensive Plans.
3. Letter dated May 5, 2003, addressed to Todd Olson, Licensing Project Manager of PacifiCorp from Phil Detrich, Field Supervisor of the United States Department of the Interior, Fish and Wildlife Service, Yreka, CA, re: Comments on the August 2002 Conceptual Outline for Characterization of Resident Fish Entrainment and Turbine-Induced Mortality at Klamath Hydroelectric Project Facilities.
4. Letter dated January 31, 2003, addressed to Todd Olson, Licensing Project Manager of PacifiCorp from Phil Detrich, Field Supervisor of the United States Department of the Interior, Fish and Wildlife Service, Yreka, CA, re: Relicensing of Klamath River Hydroelectric Project, FERC No. 2082.
5. Letter dated December 31, 2002, addressed to Todd Olson, Licensing Project Manager of PacifiCorp from Phil Detrich, Field Supervisor of the United States Department of the Interior, Fish and Wildlife Service, Yreka, CA, re: Relicensing of Klamath River Hydroelectric Project, FERC No. 2082.
6. Letter dated April 9, 2002, addressed to Michael Ichisaka, PacifiCorp, from Bruce G. Halstead, Project Leader of the United States Department of the Interior, Fish and Wildlife Service, Arcata, CA, re: Species List for Proposed Klamath Hydroelectric Project, Siskiyou County, California; Jackson and Klamath Counties, Oregon.
7. Letter dated August 6, 2001, addressed to Todd Olson, Licensing Project Manager of PacifiCorp from Bruce G. Halstead, Project Leader of the United States Department of the Interior, Fish and Wildlife Service, Arcata, CA, re: Relicensing – First Stage Consultation – Review of Draft Study Plans.
8. Letter dated March 27, 2001, addressed to Todd Olson, Licensing Project Manager of PacifiCorp from Bruce G. Halstead, Project Leader of the United States Department of the Interior, Fish and Wildlife Service, Arcata, CA, re: Relicensing – Initial Comments upon Review of First Stage Consultation Document.

9. Letter dated January 8, 2001, addressed to Mike Ichisaka of PacifiCorp from Kemper M. McMaster, Oregon State Supervisor of the United States Department of the Interior, Fish and Wildlife Service, Portland, OR, re: Klamath Hydroelectric Project (1-7-01-SP-090).

Service concerns and comments were also included in the April 8, 2003, letter from the U.S. Department of Interior to PacifiCorp, and in e-mails from the Service dated June 20, 2003, to Todd Olson; and August 15, 2003, to Toby Freeman.

**GOALS OF THE LONG RANGE PLAN FOR THE KLAMATH RIVER BASIN
CONSERVATION AREA FISHERY RESTORATION PROGRAM (USDI Fish and
Wildlife Service 1991):**

- I. 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.
- II. Ensure that the Klamath Fishery Management Council devises harvest regulation recommendations that will provide for viable commercial, recreational and tribal fisheries.
- III. 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.
- IV. Inform the public about the value of anadromous fish to the Klamath River region and gain their support for the Restoration Program.
- V. 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.

In particular, Objective 2.E. of the LRP is: Protect salmon and steelhead habitat from harmful effects of water and power projects in the Klamath Basin. Sub-Objectives that pertain to this relicensing include:

2.E.1.A Reevaluate (from the 1966 study (Fortune et al. 1966)) 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.

SERVICE GOALS REGARDING RELICENSING OF THE KLAMATH RIVER PROJECT (USDI Fish and Wildlife Service 2003):

1) Restore native fish populations within the Klamath Basin to provide fishery resources necessary to meet Tribal Trust responsibilities for commercial, subsistence, and ceremonial purposes; and to enhance ocean commercial harvest, recreational fishing, and the economic health of local communities.

2) Restore volitional passage for all life history phases of anadromous and resident fishes throughout their historical range. Provide necessary water quantity, flow regimes, water quality, and other habitat conditions for the recovery and long-term sustainability of native fishes.

3) Recover federally-listed threatened and endangered species in the Basin by avoiding jeopardy, avoiding and minimizing take, and completing recovery actions identified and detailed in recovery plans. Protect and restore habitat for federally-listed and candidate species.

4) Protect, mitigate, and enhance habitat for waterfowl and other migratory birds, terrestrial wildlife, fish, plants, and invertebrates.

5) Enhance ecological function and watershed processes to meet the above goals.

RELICENSING STUDY STATUS

In 2000, PacifiCorp initiated a series of relicensing studies aimed at evaluating the impacts of the Klamath Project on the biological resources of the Project area. PacifiCorp divided these study areas into specific categorical areas commonly referred to as “working groups.” These “working groups” included Aquatics, Fish Passage, Water Quality, Terrestrial Resources, Cultural Resources, Socioeconomics, and Recreation. The following is a summary of relicensing studies conducted by PacifiCorp in coordination with the Relicensing Working Groups:

Studies Requested by the Service and Completed by PacifiCorp:

Distribution and Biology of Suckers in Lower Klamath Reservoirs, March 2000

Bathymetry and Sediment Classification of the Klamath Hydropower Project Impoundments 2003

Studies Requested by the Service and Not Completed by PacifiCorp:

A number of studies have been approved and are underway. Studies listed in Table 1 have been requested by the Service or the Collaborative, and have not yet been approved by the Plenary Group as of September 2003 due to the inadequacy of study plans.

Table 1. Studies requested by the Service or the Collaborative and not yet approved by the Plenary Group as of September 2003 due to the inadequacy of study plans.

Study Title - Aquatics Work Group	Status
1.12 Instream Flow Analysis Study Plan	Critical - Close to Final
1.16 Evaluation of Effects of Flow Fluctuation on Aquatic Resources within J.C. Boyle Peaking Reach	Critical - Not Final
1.17 Investigation of Trout & Anadromous Fish Genetics in Klamath Hydro Project Area	Not Final
1.24 Evaluation of Ramping Downstream of Iron Gate Dam	Critical - Not Final
1.23 Sampling of Fisheries in Project Riverine and Reservoir Areas	Critical - Not Final
1.9 Fisheries Investigations	Critical - Not Final
Study Title - Fish Passage Work Group	Status
1.10 Fish Passage Planning and Evaluation	Critical - Not Final

Summary of Relicensing Study Results

Of the studies underway, generally only preliminary results are available. For example, background information and methods are described for Study Plan 1.15, Trout Movement in the J.C. Boyle Bypass and Peaking Reaches, but no results have been provided in the DLA (Fish Resources Draft Technical Report (DTR), Pages 2-91 through 2-96); some results have been provided at the September Collaborative meeting. With the exception of the Water Quality study, almost no results have been provided in the DLA.

DESCRIPTION OF THE DRAFT APPLICATION

Relicensing Issues

As stated in 18 CFR § 16.8, the DLA is required to provide a characterization of the existing environment, evaluation of impacts, and proposed PME's. In regard to these requirements, the Service is providing specific comments on the eleven issues of the DLA, as follows:

Upstream Fish Passage, Problem Statement:

The Project excludes anadromous fish from upstream passage to hundreds of miles of former habitat. Existing passage and protection facilities for resident fish are ineffective and not built to present criteria. While the DLA acknowledges that Project facilities and operations exclude fish from native habitats (Fish Resources DTR, page 1-3; Fish Resources DTR, Page 5-1), no quantitative assessment is provided. Problems with existing upstream passage structures and facilities, which are significant, are not acknowledged. In fact, Table ES4.4-1 (pages 4-6 of the Executive Summary) goes so far as to state that "use of the fish ladder at the J.C. Boyle dam by trout has declined markedly since the dam was built but not due to ladder function." There is no supporting information in this document showing that the decline is not due to ladder function. The DLA states incorrectly that one of the Fish Passage Planning and Evaluation Study (Study Plan 1.10) purposes is to determine the feasibility of passage options (Fish Resources DTR 5-1). This reference to 'feasibility' has been removed from the latest version of Study Plan 1.10 by PacifiCorp at request of the Collaborative.

Upstream Passage, Current Condition/Existing Environment - Redband/rainbow trout (*Oncorhynchus mykiss*) passage studies at the existing upstream fishway at J.C. Boyle indicated that in 1959, over 5,500 trout used the ladder (Hanel and Gerlach 1964), while from 1988-91, only 70 to 588 trout used the ladder. This points out a dramatic decline in fish passage (Hemmingsen et al. 1992). Contemporary passage continues to be less than 10 percent of that reported one year after Project construction of J.C. Boyle Dam (Oregon Department of Fish and Wildlife (ODFW) 2001). Preliminary results of radio-tagging studies of redband trout movements, presented at the September 2003 Collaborative meeting, showed that only one of 28 tagged trout passed upstream through the ladder. Additional study results may provide information in regard to whether tagged trout were able to find the ladder entrance.

Although less definitive than the J.C. Boyle information, a 1988-1991 study of the existing upstream passage at the Keno fishway concluded that redband/rainbow passage was quite low and that "factors unrelated to the variables studied here [pH, flows, and water temperature] may help to explain the low passage numbers at Keno..."(PacifiCorp 1997).

We recommend that the license application also include results of available studies on upstream passage for suckers at Link River, Keno, and J.C. Boyle (PacifiCorp 1997). Reasons for poor passage at these facilities may include improper flows, high water temperatures in the ladder,

and/or false attraction flows from the tailrace, but no definitive study of this problem has been completed.

Upstream Fish Passage, Project Impacts - Because problems with upstream passage at the J.C. Boyle or Keno facilities are not acknowledged, no impacts are assessed. The DLA includes no assessment of the quantity and quality of anadromous fish habitat blocked above Iron Gate Dam as a result of the Project. The Ecosystem Treatment and Diagnosis Methodology (EDT) and KlamRAS models (intended to provide an index for the comparison of the effects of different management options on habitat) are not completed, and thus, the Service must rely on historical and other information for an assessment of the quantity and quality of habitat above Iron Gate Dam.

Upstream Fish Passage, PMEs - Drawings for new upstream passage facilities are provided along with costs, but the DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate.

Service Recommendations and Conclusions Regarding Upstream Passage:

The Service recommends PacifiCorp conduct definitive studies to determine why the existing Keno and J.C. Boyle ladders are not passing the optimal number of redband trout and suckers upstream. These studies need to be initiated immediately to determine the causes of ineffective upstream passage. If Reclamation installs a ladder at Link River, such studies will not be necessary at that facility.

Upstream passage studies should include, but need not be limited to:

- 1) An examination of flow records for the J.C. Boyle and Keno ladders. This will help assess whether proper flows have been released through the ladders.
- 2) A comparison of flow distribution rates for the J.C. Boyle ladder and powerhouse during the first years after ladder installation versus current flow distributions for the J.C. Boyle ladder and powerhouse. This would help assess whether there are now false attraction flows from the powerhouse.
- 3) Measurements of water height at weirs and entrance of all ladders. This will ensure that ladders are being operated as designed.
- 4) An examination and comparison of water temperatures in the J.C. Boyle ladder, the bypass channel, and in the tailrace of J.C. Boyle powerhouse. This would help determine if there are water temperature differentials between ladder flows and the bypass. These measurements would also determine if the ladder is increasing water temperature. Historical ladder water temperature data should be provided, if available, for all ladders.

- 5) A complete reporting of tagged trout movements to date below, above, and through the J.C. Boyle facility ladder from Study Plan 1.15. This report should include the range of detection for each antenna. This will help our understanding of where fish are impeded in their upstream migration.
- 6) An adequate summary of the temporal and spatial movements of redband trout and suckers in the J.C. Boyle, Keno, and Link River reaches of the Klamath River from Study Plan 1.15 and other studies. This information will put the above study in context.
- 7) Potential continuation of existing radio-tagging studies through the fall 2003 migration of redband trout, with an adequate number of trout (possibly with thermal sensors) to better determine fish attraction and movements to and through the J.C. Boyle ladder and tailrace flows under different temperature regimes. This may require 6-10 antennae placed strategically along the length of the ladder.
- 8) Potential radio tagging of suckers (possibly with thermal sensors) to determine fish attraction and movements to and through the Keno and J.C. Boyle ladders.

The Service requests further evaluation of new upstream fish passage facilities, including fish lifts, at Copco 1, Copco 2, and Iron Gate Dam is requested. We also request that more detailed information be provided in regard to the cost estimates for fishways presented in the DLA. The Service may need to conduct its own analyses of the fisheries data and review of the literature and existing studies, and, if necessary, ask for additional studies to address critical information needs.

Downstream Passage, Problem Statement:

Fish moving downstream, including federally-listed suckers, are entrained into generation facilities with significant mortality. At such time as passage is re-established, out-migrating anadromous salmonid smolts would be entrained and killed by turbines. With the exception of the J.C. Boyle facility, there are no downstream fish screens or other exclusion devices to prevent entrainment and mortality. At the J.C. Boyle facility, screens are ineffective and not built to present criteria. While the DLA acknowledges that the Project and facilities entrain “some” downstream migrants (Fish Resources DTR, page 1-3; Fish Resources DTR, Page 5-1), no quantitative information is provided regarding previously documented entrainment of downstream migrant fish. For instance, significant entrainment of fish has been documented in 1997-1999 at the Link River Dam hydroelectric facility (Gutermuth et al. 2000). This and other existing information should have been cited and addressed.

Downstream Passage Current Condition/Existing Environment - No entrainment mortality studies have been initiated for any facilities below Link River, and PacifiCorp has declined to do these studies to date, proposing to substitute a literature review instead. Because entrainment and mortality are highly variable and need to be studied on a site specific basis, the Service continues to recommend entrainment mortality studies at all facilities, including J.C. Boyle.

At the J.C. Boyle dam, which is the only facility with existing downstream entrainment protection, the screens that are currently installed are not designed to current criteria and are ineffective. The ODFW (2001) reported fish salvages in the J.C. Boyle power canal of 133, 12, and 68 trout in July 1988, 1990, and 1991, respectively, when the Project was shut down for annual maintenance. Fish ranged in size from 50-300 mm. This was reported as “alarming as only a small percentage of the total volume of water in the canal was sampled, and that fish screens had been operating at J.C. Boyle since the last shutdown. The finding of fish in the canal seems to indicate the effectiveness of the J.C. Boyle dam fish screening devices is limited at best.” (PacifiCorp 1997) also reported tagging a high number of fish as a result of salvage operations in the canal below the dam. The May 1988 ODFW monthly report also reported sampling the attraction flow diffuser chamber at J.C. Boyle dam with a backpack electroshocker, resulting in the capture of seven redband trout, ranging in length from 142-337 mm. Further, PacifiCorp has documented all suckers and trout salvaged during Project shutdown and maintenance operations since 1995. Since then, a total of 785 suckers and 919 redband trout have been salvaged during maintenance activities. Of the 785 suckers, 228 were federally-listed species, of which shortnose (*Chasmistes brevirostris*) and Lost River (*Deltistes luxatus*), suckers comprised 24 and five percent, respectively. Of the 785 suckers, 533 were less than six inches in length, which makes species identification impossible. Finally, preliminary radio-tracking results presented at the Collaborative meeting in September 2003 showed that the radio-tagged 14-inch trout that passed upstream through the J.C. Boyle ladder also migrated downstream through the power canal and turbines and was not excluded by screens.

The above information clearly indicates that both small and large fish are passing through or around downstream protection screens.

Downstream Fish Passage, Project Impacts - Studies are needed regarding entrainment/mortality at each facility, including the failure of existing screens at J.C. Boyle. Fish Passage Study 1.10 has not yet been approved by the Collaborative because the study plan is inadequate.

Downstream Fish Passage, PMEs - Drawings and cost estimates are provided for new downstream passage facilities, however, the DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate.

Service Conclusions Regarding Downstream Passage:

The Service continues to request that PacifiCorp conduct robust and complete entrainment mortality studies at all Project facilities below Link River, particularly in regard to federally-listed suckers. Federally-listed suckers are present in all Project reservoirs (Federal Energy Regulatory Commission 1990; Desjardins and Markle 2000). Entrainment and mortality of sucker larvae and juveniles has been well documented and quantified at the Link River facilities (Gutermuth et al. 2000). Downstream, at the J.C. Boyle facility, entrainment of these listed species has been documented as well (ODFW 2001, PacifiCorp website 2003). Entrainment and mortality are probably taking place at the Copco (both 1&2), and Iron Gate Facilities, but are unquantified at present.

We recommend that PacifiCorp conduct definitive studies to determine why the existing J.C. Boyle screens are not excluding the optimal number of redband trout and federally-listed suckers. These studies need to be initiated immediately.

At the existing J.C. Boyle screens, as an initial step, the background information for these studies should include at least the following:

- 1) An inspection of the J.C. Boyle screen(s) by PacifiCorp, FERC, NOAA Fisheries, and Service fish passage engineers.
- 2) An adequate summary of the temporal and spatial movements of redband trout and suckers in the J.C. Boyle, Keno, and Link River reaches of the Klamath River.
- 3) An examination of J.C. Boyle screen maintenance and repair records, including the periods when the screen was removed.

Based on this background information, additional studies might be designed to provide more data to inform remediation efforts. Prompt completion of these studies is important, because a supportable estimate of mortality of federally-listed suckers will be essential to FERC's section 7 consultation for the relicensing of the Project. The Service will review these mortality estimates before we complete a BO or exempt the prohibition of take pursuant to section 9 of the Endangered Species Act for the Lost River and shortnose suckers.

In addition, entrainment and mortality studies should be conducted at each facility in regard to the future passage and fishway design for resident fish and anadromous species, including salmonids and lamprey.

General Recommendations and Conclusions Regarding the Fish Passage Issues:

The DLA acknowledges PacifiCorp's obligation in the Project relicensing to assess the adequacy of existing fish passage facilities and to evaluate the need for additional facilities (Page 5-1, paragraph 4). However, there is very little discussion of Project impacts or of the quantitative assessment and evaluation required. In some critical study areas, such as entrainment/mortality studies, PacifiCorp has been unwilling to conduct necessary studies, despite past requests from the Service (letter dated May 5, 2003, addressed to Todd Olson) and DOI (letter dated April 8, 2003, addressed to Toby Freeman).

Based in part on PacifiCorp study reports, the Service, NOAA Fisheries, Tribes, and States have identified fish passage as a substantial issue that should be thoroughly addressed. However, the DLA provides very little analysis of the scope and magnitude of these problems. Particularly, further study is necessary regarding potential improvement of passage by physical and operational modifications at all Project dams.

At two locations in the DLA, reference is made to the use of fish hatcheries as mitigation for fish passage (Executive Summary, page 4-3; DTR, page 5-1). The existing hatchery was only

required to mitigate for the elimination of access to the 16 miles of mainstem and tributary habitat between Iron Gate Dam and Copco (Federal Energy Regulatory Commission 1963). There are potentially several hundred miles of anadromous salmonid habitat above Copco 1 and 2 for which no mitigation has been provided by hatcheries. Thus, the hatchery has provided only partial mitigation for the impacts of the Project.

The use of fish hatcheries in lieu of mitigation for fish passage is generally inconsistent with the recommended restoration approach in the LRP (USDI Fish and Wildlife Service 1991). Resource agency management priorities currently emphasize the protection of existing native aquatic resources through the implementation of the LRP for the Klamath River, and agency goals call for eventual restoration of full volitional passage at all facilities.

In regard to the quantification of upstream habitat, in the absence of studies developed by PacifiCorp, the Service believes that NOAA Fisheries' assessment of anadromous habitat blocked by the Project (Edmondson 2003) is reasonable and the best information available. This assessment estimates that, with the provision of passage, there would be more than 290 miles of habitat for anadromous species and at least 60 miles of habitat for the federally-listed coho salmon above Iron Gate Dam. With dam removal, it is estimated that there would be at least 312 miles of anadromous habitat and approximately 77 miles of habitat for the federally-listed coho salmon above Iron Gate Dam. This habitat has suffered degradation in some locations, such as Lake Euwana, but generally continues to provide a productive environment for redband trout and, at some locations, other salmonids, including brown and brook trout. Our general conclusion is that habitat above Iron Gate Dam would provide a productive environment for anadromous salmonid spawning, incubation, and rearing.

Water Resources (including hydrology and Project effects on hydrology), Problem Statement:

Studies of the hydrology of the Klamath River and Project impacts to its flow regime are the foundations of other studies vital to relicensing. These include geomorphology, in-stream flow assessments for fish habitat, water quality, recreation, and socioeconomic studies. However, the data and discussion on hydrology in the DLA are insufficient to describe the area affected and to analyze the Project effects associated with potential alternatives other than status quo. The DLA gives particular attention to those factors that are not linked to Project operations and has described them in detail disproportionate to the analysis afforded to Project-related impacts. In this respect, the DLA is inadequate. Consideration of the relative magnitude of various impacts to hydrologic processes in the Klamath River as a whole is not the applicant's responsibility. Rather, the purpose of the DLA is to document the existing environment and impacts related to the Project.

Water Resources, Project Impacts - Almost no Project impacts to hydrology or flow regimes are discussed in the DLA. In particular, there is no description or discussion of the impacts of the Project to the hydrology within the 64-mile Project reach between Link River Dam and Iron Gate Dam.

Water Resources, PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies. Potential PME's based on modified peaking or elimination of peaking on daily and/or seasonal time steps should be explored.

Service Recommendations and Conclusions Regarding Water Resources:

The discussion of hydrological conditions affected by the Project is insufficient. Neither the existing environment nor Project impacts are fully described. Important information regarding the hydrological baseline, effects of peaking operations, flows in bypass reaches, and the effects of trans-basin diversion of water is absent. This information is needed to fully assess Project impacts on fisheries, water quality, riparian vegetation, geomorphology, recreation, in-stream aquatic habitat, and socioeconomics.

We recommend that the FLA describe the baseline hydrology of the basin with the agreement of the Collaborative group. Project effects to flow regimes on a daily to weekly basis should be described in sufficient detail for all reaches. In particular, the interactions between irrigation effects and hydro effects on the Link River and Keno reaches should be well described. Project impacts on peak and flushing flows should be adequately addressed, as well as long term impacts of the Project. We also recommend that PacifiCorp's operational flexibility in managing the six mainstem dams and the capability of the Project to affect seasonal flow patterns be thoroughly discussed.

Sediment and Geomorphology, Problem Statement:

Project operations have substantially altered the natural hydrograph of the mainstem River with associated effects to river geomorphology and sediment transport. Processes affecting channel morphology, gravel recruitment and bed armoring, bedload composition, and other attributes are now dictated by the altered flow regimes and the presence of Project facilities in the River. In addition, sediment retention in Project reservoirs and the altered flow regime have changed the natural sediment processes in the River.

Sediment and Geomorphology, Project Impacts - Almost no Project impacts are discussed. There is insufficient information in the DLA to adequately understand Project impacts on geomorphic and sediment processes in the River. The DLA mainly provides a description and discussion of ongoing studies. Although some initial results are presented, many of the studies are not scheduled to be completed until summer of 2004. Project impacts are discussed in generalities, but few specific Project impacts are identified. For example, there is no discussion of the effects of flow fluctuations on sediment transport, which is a critical issue for fisheries habitat below Iron Gate Dam.

The DLA presented an initial estimate of the water storage volumes lost in Project reservoirs due to sediment retention. However, to better understand this impact, we recommend that a more detailed characterization of the amount, composition, and particle size of sediments retained by

Project reservoirs be provided. We recommend an analysis of operational flow fluctuations, especially peaking, on sediment transport.

Sediment and Geomorphology, PMEs - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PMEs are provided in the DLA for consideration by the agencies.

Service Recommendations and Conclusions Regarding Sediment and Geomorphology:

The Service recommends that PacifiCorp complete all planned studies in a timely manner. The Service hopes that results will be available for discussion in the work groups prior to development of the FLA. The FLA should fully describe and discuss how Project facilities and operations have altered geomorphic and sediment processes, and the impacts of those changes on aquatic resources for all Project reaches and the mainstem River below Iron Gate Dam.

Minimum Flows, Problem Statement:

Instream flows in the Project reaches are affected by Project operations over a wide range of River flows. The determination of minimum flow levels that adequately protect fishery and other aquatic resources and maintain the ecological functions of the River are an important aspect of the licensing process.

In most Project reaches, minimum flows are specified in articles of the current operational license. However, in some reaches, current minimum flows are determined and maintained outside of the licensing process, as mandated by BOs issued by the Service and NOAA Fisheries. These flows are subject to change during the term of the new license, and the FLA should analyze other flows that might be proposed if some degree of control is returned to PacifiCorp.

In addition, there are no minimum flows for the Copco bypass reach prescribed under the current license. Minimum flows sufficient to protect fish and wildlife resources and maintain channel integrity will need to be established for all Project reaches in any new license.

Minimum Flow Existing conditions - In Exhibit E, Section 3, the DLA has detailed the existing flows in each Project reach. The DLA has adequately described the various inter-relationships with Reclamation to meet specific target levels for upper Klamath Lake levels and for flows downstream of Iron Gate Dam that affect the Project's ability to control flow levels throughout the Project area and downstream. However, no information is provided regarding the amount and quality of fish habitat in the Project reaches under current Project flows and flow fluctuations.

The DLA does not provide information on the full range of water storage and flow management or the flexibility that PacifiCorp would have without the various contracts and Reclamation's ESA mandates in effect. The Service believes that this information is important to allow evaluation of specific Project impacts and potential flow-control capabilities, and to assist in the

development of PMEs. For example, in Exhibit E, Section E.3.1.6, the DLA states that there is little control of the flows that pass through Keno Dam because of the contractual agreement with Reclamation to maintain reservoir levels. In the FLA, we recommend that PacifiCorp provide an evaluation of the potential flexibility they would have without this agreement in place.

In addition, we recommend that the application provide a complete analysis of the storage capabilities of the Project. This should include a full analysis of the Project's ability to manipulate both the quantity and timing of flows at all Project facilities. PacifiCorp has stated at various Collaborative work group meetings that they have limited flexibility to manipulate flows. We recommend that the application fully describe the limits of flexibility and provide a rationale for any limitations. The availability of additional flows from Project storage during the 2002 fish die-off event in the lower Klamath River indicates that some flexibility exists and may be beneficial to downstream resources.

Minimum Flow Project Impacts - No impacts of Project-related flows or flow fluctuations are described in the DLA. The DLA correctly states that instream flow studies in many Project River reaches are currently underway (Study Plan 1.12). While this study plan has not been approved by the Aquatics Working Group, much of the necessary field work is underway or has been completed. No results are presented in the DLA. The Service requests that the results and analyses from the instream flow studies be made available for discussion within the Aquatics Work Group prior to the development of PMEs.

We recommend that a thorough review and analysis of the impacts of current operational flow fluctuations and the minimum flow levels specified in the current license be provided as a basis for evaluating a range of other potential operational flow scenarios. At a minimum, impacts of current Project operational flows on aquatic resources and stream channel processes should be thoroughly addressed in the FLA.

PacifiCorp has not agreed to conduct instream flow studies in the Keno reach, delaying progress on the development and approval of the instream flow study plan. The Service recommends that the FLA provide analysis of the impacts of current Project minimum and operation flows in the Keno reach. Instream flow modeling should be completed to evaluate the effects of potential alternative flows.

The current instream flow study plan calls for the measurement and prediction of fish habitat in terms of physical habitat parameters (i.e. WUA or weighted-usable-area). While this an important step in evaluating the effects of flows on fish habitat, distribution, abundance, and health, it will require an integration of results from flow studies with results from water quality, fish assessment, macro invertebrate studies, and other studies. No single-topic analysis will provide the information necessary to sufficiently evaluate the effects of a suite of potential flow scenarios on fish and other aquatic biota. For example, it will not be sufficient to characterize WUA and habitat availability at specific flows without a thorough analysis and discussion of the effects of those flows on other conditions in the affected reaches.

Minimum Flow Proposed PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

The DLA states that the results of the instream flow studies will be incorporated into the FLA and any new flow recommendations will be put forth at that time. This is contrary to Exhibit E, Section E.3.1.7, which states that no changes in Project operations are being proposed that would require changes in current minimum flows.

Service Minimum Flow Recommendations

In the absence of sufficient information on the specific effects of Project flows and flow fluctuations on fish habitat and other aquatic resources, the Service will likely recommend minimum flow rates designed to ensure the health and sustainability of the affected resources.

The Service recognizes that PacifiCorp must currently provide downstream flows mandated by the NOAA Fisheries 2002 BO. However, those are minimum flow levels deemed necessary to specifically protect coho salmon. Quantity and timing of those flows may not be adequate to protect resident and other anadromous fishes in the Project area. Additionally, those mandated minimum flows may be altered in the future and cannot be assumed to remain in place for the duration of a new license.

Ramping Rates/Stranding, Problem Statement:

Ramping rates are important because rapid decreases in flow may strand rearing fishes and other organisms that cannot respond to receding water levels (Cushman 1985; Hunter 1992). Rapid increases in flows can also have adverse effects.

Ramping Rates/Stranding, Existing Condition - Up and down ramping takes place in the peaking reach below the J.C. Boyle Powerhouse. To a lesser extent, ramping takes place below Iron Gate Dam within the limits specified in the NOAA Fisheries BO. Contrary to the information previously reported, fish stranding has occurred (most recently on March 6, 2003) below Iron Gate Dam (Tom Shaw, USFWS, pers. communication) since the NOAA Fisheries 2002 Biological Opinion ramp rates went into effect. Stranding has been observed when Iron Gate Dam is spilling. Rapid reduction of flows could potentially take place when Iron Gate Dam is in spill mode if upstream facilities were abruptly turned off to store for the next generation cycle. At recent Collaborative meetings, the Service requested information regarding down ramping for J.C. Boyle and the Copco facilities when Iron Gate is spilling. This information has been provided and is under review by the Service.

Ramping Rates/Stranding, Project Impacts - The DLA does not describe the impact of strandings on fish populations in the Project area. A literature review is provided that describes studies from other systems on the factors influencing stranding frequency from ramping. However, no

conclusions are made concerning what the appropriate ramping rates should be at Project facilities to minimize the likelihood of impacts.

Ramping Rates/Stranding, PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

Service Recommendations and Conclusions Regarding Ramping Rates/Stranding:

Studies should examine stranding rates in relation to factors found to affect stranding rates in other areas (i.e., rate of ramping, time of day, season, etc.). The study plan for ramping impacts that is provided in the DLA does not include a complete description of sampling effort.

The DLA includes a description of the ramping rates at all of the facilities. Exceedence curves or other frequency information on ramping rates are provided for each facility; however, the significance of these rates and their exceedence should be fully analyzed from the standpoint of effects on fish and other aquatic organisms. This type of analysis will be required to justify ramping rates in the FLA.

Water Quantity and Quality Assessment (Section E.3 Water Use and Quality), Problem Statement:

The quality and quantity of water in the Klamath River as it is affected by the Project is critical to aquatic resources, including resident and anadromous fishes, Tribal Trust resources, and water-oriented recreation such as sport fishing. These are important beneficial uses that DOI, and especially the Service, have authorities and mandates to protect and conserve.

Existing Conditions - The DLA reasonably characterizes the broad-scale existing water quality conditions within the Project area in a historical context. Much of the available water quality data appear to be compiled, and the general trends described both in the narrative and in graphs. Water quality data obtained by the Bureau of Land Management near the Oregon-California border, however, are not included. The Project-level data presentation and discussion in the DLA falls short of what is needed to assess Project impacts, especially for individual facilities. While the DLA lacks adequate detail in the facility-level impact analysis, it gives too much attention to those factors that are not linked to Project operations, and has described them in detail disproportionate to the analysis afforded to Project-related impacts. Water quality issues needing more development in the application include: 1) effects analysis of each facility; 2) impact analysis of diversion of cool, dissolved oxygen (DO) rich water from Spring Creek/Jenny Creek; 3) impact analysis of peaking and of low flows in the by-pass reach on water quality, especially temperature; 4) discussion of DO in Project reservoirs; and 5) nutrient loading from sediments in Project reservoirs.

In the DLA there is a general lack of literature review. This is disappointing, considering that the applicant has developed a comprehensive bibliography. The few citations seem to be those

that were developed for previous Project proposals, e.g., for the Salt Caves Project, rather than from agency and peer reviewed literature. In Section 3.2, page 13, there is no review of previous water quality studies on Link River, Lake Ewauna, or Keno Reservoir. There is no mention of a recent thesis that specifically covers water quality in the Project area (Campbell 1999). Other significant water quality papers not included in the DLA were (Hanna 1997), (Flug and Scott 1998), (Scott and Flug 1998), (Hanna and Campbell 2000), and (Campbell et al. 2001).

Some of the omissions identified above could have been remedied had the applicant provided this section of the DLA to stakeholders earlier in the Collaborative Process. Since much of the information presented in section E.3 is background data and reports that were previously available, it should have been compiled and shared with the collaborators early in the initial phase of the relicensing process. If this had been done, it would have helped direct the Collaborative Process towards identification of data gaps and likely would have saved the applicant and collaborators considerable time and money. The Service and other collaborators have pointed out the lack of literature reviews numerous times during the Collaborative Process.

Water Quality Project Impacts - Section E.3 provides discussion of how the Project affects water quality, but the discussion is primarily limited to areas where the effects are minimal. Almost nothing is presented on water quantity impacts. We believe the analysis of Project impacts in the DLA is inadequate for the applicant, the FERC, and stakeholders to adequately ascertain how the Project affects water quantity or quality. Because the results of the detailed modeling were only recently completed, they are not included in the DLA. Some data gathering is still ongoing. Analyses of impacts on water quality and quantity are highly dependent on adequate data and appropriate modeling to assess cause and effect relationships. Insufficient data and lack of the modeling results make it impossible to understand Project impacts.

Water Quality Proposed PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

The development of effective PME's is only possible if Project impacts are accurately identified and analytical tools are developed. For example, selective water withdrawal from Iron Gate Reservoir, while reducing water temperatures downstream, might decrease dissolved oxygen levels (Campbell et al. 2001). Thus, given the assumptions of the study, selective water withdrawal from Iron Gate Dam would not appear to provide adequate mitigation. Other technology that could aerate Iron Gate flows, increasing dissolved oxygen, could be assessed once acceptable simulation tools are in place.

Service Recommendations Regarding Water Quantity and Quality Assessment:

In the absence of a more comprehensive analysis of Project impacts on water quality and quantity, the Service will have to take a conservative view of how the Project affects the Klamath River and its aquatic resources. It is the applicant's responsibility to provide an

adequate impact analysis and develop appropriate PME's that are based on the impact analyses. Because data collection and modeling are still ongoing, we are concerned that additional studies will be proposed to be continued after the FLA has been issued. Thus, fundamental information will not be available for use in evaluating the necessary range of alternatives and developing PME's. Therefore, we recommend that the applicant make the most of the available time before the final license application is due and complete the necessary data gathering and modeling on which Project impact analysis and PME's need to be based. Without completion of adequate studies, the Service anticipates requesting additional water quality studies as part of FERC's Additional Information Request process.

Fisheries Assessment, Problem Statement:

Characterization of the existing fish community is fundamental information critical to the understanding of the existing environment, and to determination of the impacts of hydropower facilities and operations. However, the DLA (FTR Section 2.0 Fisheries Assessment Studies (and Fishery Resources in general)) does not present an acceptable analysis of the condition of the existing fish community in the Project area or elsewhere in the Klamath River.

Existing conditions - The fish community in the Project area is described, but not quantified to the degree that valid comparisons among Project reaches or with other systems can be made. The DLA describes what species are living in the Project area, but the results do not allow characterization of the structure of the fish community. The descriptions presented rely heavily on previous studies (Desjardins and Markle 2000) to provide much of the necessary quantification of the fish community. While some of those studies were more scientifically sound than what the applicant has done, they were conducted to meet different objectives.

Project Impacts - No analyses of Project impacts on the fishery resources are presented. Impacts of Project facilities and operations on existing fishery resources need to be addressed in the FLA. Potential impacts of the existing fish community on anadromous salmonids, at such time as they might be restored to the Project area, need to be addressed also. This includes the potential for predation on fry and juvenile salmonids.

Proposed PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

Service Recommendations Regarding Fisheries Assessment:

In the absence of more reliable quantification of the structure of the fish community and the abundance of key species such as trout, lampreys, and ESA-listed suckers, the Service will take a conservative view of the health of the fishery resources. The Service may also need to conduct its own analyses of the fisheries data and review of the literature and existing studies. If necessary, we will ask for additional studies to address critical information needs. The DLA has

provided a review of most of the existing information on fishery resources in the Project area, and we recommend that this review be used as a basis for designing more rigorous studies.

In the draft study plans for Fisheries Assessment now being considered by PacifiCorp and the Aquatic Working Group, the timelines indicate a post-final license application schedule for conducting any additional studies. Thus, a key piece of fundamental information will not be available for use in evaluating the necessary range of alternatives or identification of PMEs.

Terrestrial Wildlife, Problem Statement

Electrocution and collisions with powerlines likely have and will continue to negatively impact birds that reside in or pass through the Project area, possibly including federally-listed bald eagles and northern spotted owls. Some individuals mortally wounded by electrocution or collision may fly from the point of impact and are therefore not counted by periodic patrols. It is also highly likely that avian mortalities are carried away or scavenged by predators prior to being detected by Project personnel. For these reasons, it is likely that Project transmission line mortality data is an underestimate, and that avian populations will continue to be affected by conditions created by Project transmission lines.

Fire suppression in Project area has caused wildlife habitat degradation (Terrestrial Resources DTR, page 2-61). Project lands have been altered by changes in the natural fire regime that occurred on those lands. Some Project lands are overstocked with trees or are overrun with exotic noxious plants. Wildlife may also be affected by Project roads, increased access, and operations. Project roads have created better vehicular access, allowing snags and coarse woody debris to be removed as firewood. Project roads have also allowed better access for off-road vehicles that have caused damage to some areas.

Wildlife movement and/or migration routes can be interrupted or blocked entirely by reservoirs, canals, or even large road systems. It may be evident that certain individuals are able to quickly adapt to these habitat changes, but long-term effects may include decreased ability to locate mates, reduced parental investment/involvement with young, decreased ability to disperse, reduced fitness, and/or an increase in introduced stimuli resulting in increased predation risk (Frid and Dill 2000); (Sutherland et al. 2000).

Terrestrial Wildlife, Project Impacts - The DLA has concluded that there is no evidence that facilities create adverse effects on wildlife movement and that there has been no documentation of increased wildlife mortality from the attempted crossing of canals or reservoirs (DLA, Vol. 2 Exhibit E, page 5-98). We recommend the application provide sufficient information to support these assertions.

In particular, the effects of powerlines on birds was not adequately analyzed. The DLA concluded that the powerlines associated with the Project do not appear to present a problem for avian electrocutions or collisions (DLA Vol. 2 Exhibit E, page 5-99), but this contention was not well-supported. The data are collected incidentally during other Project operations (i.e., when a

power outage is caused by a bird electrocution) and not through systematic surveys. No monitoring of avian collisions is conducted, which are likely the greatest risk to birds. Also, the DLA has not addressed powerlines within the Project area that are not “Project facilities”, even though some of those powerlines are clearly associated with the Project.

The J.C. Boyle canal should be considered an impassible barrier for medium and small mammals, reptiles and amphibians. It also likely poses a substantial barrier to large mammals. The Fall Creek, East Side, and West Side canals likely pose some hazard or risk to wildlife.

Terrestrial Wildlife, PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

Service Recommendations and Conclusions Regarding Terrestrial Wildlife

We recommend that the application adequately describe the existing environment and Project impacts. Bird electrocutions only happen at isolated locations on transmission lines (such as transformers) and are relatively easy to prevent. The Service recommends that specific surveys be developed to monitor avian powerline mortality. All powerlines should be constructed to standards that minimize electrocution risks to birds (California Energy Commission 1999).

The Service regards collisions with powerlines in the project area as a higher risk to avian species than electrocution. PME's should be developed to upgrade distribution and transmission lines in the vicinity of the Project to the safest designs for prevention of avian collisions and electrocution. We recommend that data collected on powerline line mortality be included in the DLA.

The Service recommends that road impacts be studied further and appropriate PME's be developed. We recommend that information on project lands in need of vegetative thinning or exotic plant management be incorporated in the FLA and appropriate PME's developed to mitigate the adverse impacts. We recommends that roads through sensitive areas be obliterated or closed, and that vegetation in the Project area returned to more natural and sustainable conditions. PME's to better restrict wildlife from canals need to be implemented.

Cumulative Project Impacts, Problem Statement

The combination of altered seasonal and daily hydrology, replacement of riverine habitat with lacustrine habitat, introduced predatory fish, reduced water quality, barriers to upstream migration, fish entrainment and mortality, and altered riparian vegetation and sediment regimes are all likely Project- related impacts that, to various degrees, have resulted in reduced habitat quantity and quality. The cumulative impacts to native fish and habitat are of great concern to the Service, but despite the requirement of 18 CFR § 16.8, none are discussed in the DLA.

Cumulative Project Impacts - The Project extirpated anadromous fish runs above the Copco Dams in 1918, and, in 1963, above Iron Gate Dam. Existing fishways for resident fish, including two federally-listed sucker species, are not effective. Entrainment and mortality continue to cause reductions of these listed suckers and other native fish populations. Flow regimes have been adversely effected and water quality has been degraded by Project impoundments. Sediment transport necessary for spawning gravel recruitment has been severely reduced and riparian vegetation altered. Together, these effects have caused reductions, perhaps synergistic, in the quantity and quality of habitat for resident and anadromous native fish. Potentially, they would also affect reintroduced anadromous species.

Cumulative Impact PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

Service Recommendations and Conclusions Regarding Cumulative Impacts:

PacifiCorp should conduct a cumulative impacts analysis of the Project. The analysis should evaluate each facility and its operation, its impacts on aquatic life, downstream water quality, sediment budget, and geomorphic conditions, as well as fish and wildlife resources. The study should explore options for management of River flows and reservoir levels along with provision of water quality conditions to meet beneficial uses, and should incorporate the expected lifespan of facilities. The study should lead to development of a hydropower alternative that integrates recovery of native resident and anadromous fish with improved water quality, passage, and habitat restoration.

There has been no discussion in the Collaborative Process regarding the 50-year license term proposed in the DLA. Given the dynamics of water management in the Klamath watershed and the rapidly evolving understanding of the cumulative effects of the Project, the Service believes a shorter license term would be more appropriate. This would allow for early review of the license to accommodate changes in priorities in resource management.

Peaking, Problem Statement

Load-following operations (i.e., peaking) in the reach below the J.C. Boyle powerhouse often result in large fluctuations in daily discharge when River flows are insufficient to maintain steady operations (i.e., less than 1500 cubic feet per second (cfs)). Daily fluctuations may range from a base flow of approximately 350 cfs to as much as 3000 cfs.

This peaking operation is an extreme case of ramping of river flows, and can occur daily for extended periods of time. Because of the magnitude of the changes, the relatively rapid ramping rate, and constant watering/dewatering of the stream bed (varial zone), the potential impacts to aquatic resources are substantial. For this reason, peaking in the J.C. Boyle reach needs to be considered as a separate impact from those of ramping rates at other Project facilities. Because peaking is an important operational feature of the Project, it is important that its impacts be fully

understood. In the FLA, relevant results of other studies need to be incorporated into the peaking impacts section.

Peaking Existing Conditions - The DLA provides an overview of peaking operations in the J.C. Boyle reach. The DLA appropriately discusses the potential impacts of peaking, e.g. stranding, on existing resources in Fish Resources Draft Technical Report Section 4.2.3. However, little specific information is provided on the existing conditions of the reach relative to natural conditions prior to the Project.

Instream flow studies are underway to characterize the amount of habitat that is de-watered on a daily basis during peaking operations. The results of those studies are not provided in the DLA. Studies of fish stranding only consist of limited visual observations. Thus, there is no quantification of the amount of fish habitat available at current base flows, of habitat lost in the varial zone, or the numbers of fish potentially stranded by down-ramping.

A full instream flow analysis of the peaking reach is needed to develop an understanding of when and where stranding might currently be occurring. Visual observations of fish stranding have been made during flow fluctuations from 1500 cfs down to 350 cfs. No observations have been made during ramping down from 3000 cfs (two turbine operation) down to 1500 cfs (one turbine) at the specified Project ramping rate. This is a critical part of the potential impacts of the full range of existing peaking operations that has not been addressed.

Other existing conditions are only being partially addressed. Macro-invertebrate communities provide a major source of food for a variety of fishes, including trout. Macro-invertebrates are being qualitatively assessed in the permanent flow channel, but statistically reliable estimates of abundance are not being made. The species composition and abundance of drift organisms present under the current peaking operations are only being minimally addressed. To determine the existing food availability for fish, species composition and abundance should be determined for the full range of Project operation flows.

Project Impacts - No analyses of specific Project impacts on the fishery resources are presented. A thorough analysis of the impacts of peaking operations on existing resources should be included in the FLA. To address this issue, PacifiCorp has developed draft Study Plan 1.16. This Study Plan was listed in the DLA, but the draft plan was not included. Because other study plans have been given higher priority by PacifiCorp, progress on this plan has been slow, and more discussions with the Aquatics Work Group are needed before approval.

The proposed Study Plan addresses peaking through an integration of a number of ongoing studies. The analysis depends on the quality and completeness of those studies, such as fish assessment and fish passage. In some cases, those studies were designed to achieve other objectives and may not be adequate to integrate with the results of Study Plan 1.16. Examples include the Macro-invertebrate and Fish Assessment studies.

The Executive Summary concludes that the trout populations are “good” in both the J.C. Boyle peaking and bypass reaches (Table ES4.4-1, page 4-5). This is a qualitative statement that is not supported by the existing evidence. It implies there are no impacts of peaking on the trout population. To the contrary, studies for the Salt Caves EIS (Federal Energy Regulatory Commission 1990) found smaller size ranges of fish in the J.C. Boyle peaking reach than in the Keno reach. The Salt Caves EIS further concluded that the peaking operations are a chronic stress on trout and cause stranding of trout eggs, juveniles, and fry. The DLA failed to address these documented impacts.

The impacts of peaking on water quality are being assessed through the development of water quality models calibrated with site-specific empirical data to evaluate peaking impacts. This is a valid approach. However, in addition to the three scenarios being assessed (current Project operations, run of river, and no-Project facilities in place), a wider range of flow-fluctuation alternatives is needed to allow evaluation of different base flows. Without examining a variety of other potential flow-fluctuation scenarios, it will be difficult to develop a strategy to reduce Project impacts and develop PMEs.

The Service believes that the comparison of the Klamath River to the Smith River in Fish Resources Draft Technical Report Section 4.2.3 is inappropriate. The Smith River is an unregulated coastal stream that is more prone to highly fluctuating flows than the Klamath River. There is no evidence to suggest that salmon that evolved in the natural Klamath River flow regime would be well-adapted to a high-fluctuation flow system, and thus, would not be negatively affected by peaking operations or frequent ramping.

Fish Resources Draft Technical Report section 4.3.1.4 states that reduced biomass and altered species composition are typical responses to extreme flow fluctuations, but that the effect on fish growth is less clear and “undoubtedly site specific.” PacifiCorp is conducting site-specific fish growth analyses, but is primarily relying on literature reviews to describe “site-specific” effects such as changes in macro-invertebrate biomass.

At a minimum, the following subjects should be addressed in the analyses of impacts of peaking:

1. Effects on fish habitat, growth and survival, behavior, abundance, and production.
2. Impacts of current base flows and effect of the magnitude of current flow fluctuations on fish and invertebrates.
3. Determination of the amount of lost instream and riparian habitat and production due to low base flows compared to other flow rates, including a no-Project scenario.
4. Evaluation of current ramping rate (0.75 feet/hr) and development of new recommendations to reduce impacts on biota.

5. Comparison of characteristics of the peaking reach to a non-peaking reach to evaluate relative magnitude of impacts.

Other studies (Federal Energy Regulatory Commission 1990); (USDI Bureau of Land Management 2002) have determined there are considerable impacts in the J.C. Boyle reach due to peaking. For instance, at 300 cfs (or approximately base flow) there is no suitable fry habitat in the upper segment of this reach (USDI Bureau of Land Management 2002).

Peaking Proposed PME's - The DLA has proposed no operational scenarios or alternatives. Thus, the Service cannot determine whether the existing information is adequate. No proposed PME's are provided in the DLA for consideration by the agencies.

Service Recommendations and Conclusions Regarding Peaking:

The DLA presented an overview of the literature regarding the effects of peaking on other rivers. However, conditions on the Klamath are unique, as are the Project facility configurations above the reach where peaking occurs. In the absence of additional quantification of the impacts of daily peaking operations, the Service will assume that impacts on fish populations are substantial and consistent with the results of other studies of the reach (Federal Energy Regulatory Commission 1990) ,(USDI Bureau of Land Management 2002). The effects of peaking should be incorporated into an analysis of cumulative impacts of Project facilities.

Mischaracterizations of Consultation and Specific Comments:

Characterization of the Collaborative Process - The DLA overstates progress made to date in the Collaborative Process. The Collaborative effort has been misrepresented in some instances and represented selectively in other instances. For example, E 4.4 Consultation...(p 4-95) incorrectly states that the Aquatics and Fish Passage working groups are working on analyses and determining impacts to the various aquatic resources. It also strongly implies that stakeholders concurred with the data collection/sampling that has gone forward without approved study plans. Further, page 10-2 of the Executive Summary makes reference to "a couple of issues where, as this DLA is being submitted, the level of disagreement remains high." In fact, there are more than "a couple of issues," and the disagreement on several key study plans is so substantial that the parties may seek dispute resolution. Table ES4.4-1 of the Executive Summary leaves the reader with the impression that the study plans are approved and results available. However, as of mid-September 2003, only two of the seven study plans in this table have been approved by the Collaborative.

Draft License Terms and Conditions/PME's were to be developed in the Collaborative Process in the 4th quarter of 2002 through the 3rd quarter of 2003 (PacifiCorp 2002), but this development has not been initiated. At the September 11, 2003, Collaborative meeting, we learned that PME's for some key studies may not be developed until after the FLA is submitted.

Continued Inadequacy of Key Relicensing Study Plans - The work groups have requested repeatedly that the applicant develop Study Plans with a sound scientific basis. Despite many months of discussion on all aspects of the study plans, several of the key plans remain inadequate and/or scientifically unsound. The majority of the unapproved Study Plans would address key issues related to major Project impacts, and are needed to provide information to develop Project alternatives and PMEs.

For some studies, such as Fisheries Assessment, Study Plan 1.9, PacifiCorp has implemented data collection without approval of the final study plan, resulting in data that has not been collected in a rigorous or thorough manner acceptable to the Service and other stakeholders. Page 2-4 of the Draft Executive Summary states that the Collaborative group has endorsed the need to implement elements of studies not yet approved. However, work groups have gone on record that any studies conducted without approved study plans are done at PacifiCorp's risk, and we have been clear that studies may have to be redone with different methods or augmented with additional sampling. The April 8, 2003, letter from DOI to PacifiCorp and FERC also states this. The Aquatics Work Group has also stated that it is PacifiCorp's responsibility to develop scientifically based studies for consideration by the group.

The DLA states that the Collaborative effort involves over 40 stakeholders and that the intent is to develop and approve study plans, interpret study results, and potentially agree on PME measures. While this is the stated goal, it does not characterize how the process has actually worked to date, or will proceed between the draft and final license applications.

Characterization of Studies - The references to “study” or studies are used very loosely in the DLA. What are characterized as studies are, in several situations, only opinions or summaries of available information that should have been presented early in the relicensing process. For example, the fish passage study (Fisheries DATR, page 5-1) is primarily a compilation of existing information. The Tables in that section contain opinion statements about the high costs of certain fish passage alternatives. The Service believes that these statements are inappropriate for this portion of the application.

Characterization of Basic Information - The DLA does not acknowledge the Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program (LRP), let alone identify any of the substantial conflicts between the operation of existing Project facilities and the goals of the LRP (provided above). The DLA would be improved by a section that describes the Task Force, the specific sections of the LRP that address hydropower operations, the importance of the mainstem Klamath River for fish and wildlife resources and habitats, and perhaps most importantly, the degree to which proposed future operation of the Klamath Project might be consistent with the LRP. This would assist FERC in fulfilling their responsibilities under Section 10(a) of the FPA. We believe this will be a critically important consideration in FERC's licensing decision for the Project. Therefore, we are willing to assist PacifiCorp in developing this section to ensure that FERC fully appreciates the importance of the Plan in the Klamath watershed and the role of the Project in fulfilling the Task Force's vision.

Lack of Impacts of the Project on Fish and Wildlife Resources - As stated in 18 CFR § 4.51 (f)(3), the Report on Fish, Wildlife, and Botanical Resources (Exhibit E) requires a discussion of fish, wildlife, and botanical resources in the vicinity of the Project and the impact of the Project on those resources, and requires that the report be prepared in consultation with the relevant state and Federal agencies. The DLA's Exhibit E does not meet this requirement. This section of the DLA should include an assessment of the effects of the Project and an analysis of cumulative impacts, but there is very little identification of impacts in the DLA.

Information Necessary for FERC to Proceed with the NEPA Process - FERC's report identifying opportunities for improving the NEPA analysis of the traditional relicensing process (Federal Energy Regulatory Commission et al. 2000) lists 16 considerations regarding decommissioning to include in a detailed analysis of alternatives for a Project. Most of these considerations apply to the Project. However, few of these considerations are discussed in the DLA. FERC will need to identify and evaluate a full range of alternatives during NEPA analysis, but the DLA does not provide fundamental information for constructing and assessing the necessary range of alternatives.

Other Comments:

Fish Resources DTR, 5.0 Fish Passage Planning and Evaluation, page 5.1, para. 5: We recommend that objectives be revised so they are consistent with revised study plan for 1.10. The objective "balance the needs of power and non-power resources," although necessary for FERC's NEPA requirements, is not appropriate here.

Specific comments on fishery studies: The DLA states that rainbow/redband trout and suckers are the focus but there has been little study of suckers. Lampreys need to be a focus species as well. Specific studies on lamprey have not been conducted, and only incidental data have been collected. There still exists considerable confusion as to what lamprey species are actually present in the Project area and the location of spawning and rearing areas, as well as habitat that is potentially impacted by Project facilities and operations.

The Fisheries Assessment studies have not been approved by the Collaborative Aquatics Work group. At numerous meetings over the past 1.5 years, Work Group members, including the Service, have repeatedly stated that the methods and sampling design do not adequately address study objectives. The sampling program was not designed to yield statistically valid results. This issue was also identified in the April 8, 2003, letter from DOI.

Fish sampling was conducted for only one year. Given the natural variability in the abundance and distribution of fish populations, multi-year sampling is the normal scientific protocol. The exploratory sampling conducted in fall 2001 could be used to determine potential sampling variability to aid in the design of subsequent studies. Because of the qualitative nature of the sampling gear employed, and the mixture of gear types, standardization among sampling methods is not possible. Thus, relative abundance can only be evaluated within a particular sampling gear type, and results from a particular reach can only be compared with similarly-

collected data for another reach or area. Potential selectivity and biases associated with the various sampling methods were discussed in the DTR, and the point made that results will be qualitative in nature, but there is no discussion of the potential effects on study conclusions. For example, the use of hook and line sampling precludes any reasonable quantification of information, because catch per angler hour can be influenced by a variety of factors unrelated to the actual abundance of fish.

Fish Resources DTR, Page 2-15: Fisheries assessment data were collected by habitat segments, but no analysis was done at that level, and data were subsequently pooled by reach. This approach is reasonable if equal amounts of the various habitat types occur in each reach and a similar amount of effort is expended in each, or if the data are weighted by the amount of habitat available. We recommend that the methods section describe whether a weighting method was used.

Fish Resources DTR, Page 2-15: Discussion on data summarization notes sampling of a wide variety of environmental parameters concurrent with fish sampling, but no methods of analysis are presented.

Fish Resources DTR, Page 2-19: The initial diet survey only distinguished between invertebrates and fish in the stomachs of sampled fish for comparing diets of redband trout among selected Project reaches. This suggests that the only hypothesis being considered is that fish in the Keno reach, which have been shown to be larger, on average, than J.C. Boyle-reach fish, feed on fish when they get older, while J.C. Boyle-reach fish do not switch from invertebrates to fish. While the diet information is important, any such changes in growth should be detectable through a thorough scale analysis. That would be the first step to determining that the observed differences in growth have an environmental, rather than genetic basis. The feeding difference hypothesis would be one of several that could be tested, along with temperature regimes, and other factors.

Fish Resources DTR, Page 2-20: The statement that the “..use of multiple methods gives a better view of the fisheries community..” is somewhat misleading. Multiple methods provide a better representation of what fish are present, but not a better picture of the true structure of the fish community. For example, the existing data on the predatory species, such as bass and yellow perch, are insufficient to allow us to determine the potential impact of these species on anadromous salmonids, or on the fry of trout species in the reaches.

Fish Resources DTR, Table E4.1-2: Arctic grayling need to be removed from the species list. We recommend that the application present more background on introduced species. The timeframe of introduction of a species might be important for determining Project impacts, since many of the exotic species in the Klamath River and its impoundments are lacustrine species and may not have survived without Project facilities in place.

Page 2-87: The DLA incorrectly states that shortnose and Lost River suckers are in Lake Euwana because they came out of Upper Klamath Lake seeking better water quality and implies

that they would not otherwise be found there. Lake Ewauna is known to have been historical sucker habitat (Mark Beuttner, USFWS, pers. comm.).

E4.2.6 Iron Gate Dam Hatchery Operations (p 4-77): Potential impacts not addressed include the effects of hatchery operations on the genetic diversity and fitness of the fish produced in the hatchery. We recommend that a detailed description be provided of the process by which adult fish returning to the hatchery are processed, handled, selected for gamete use, and how those gametes are mixed.

The DLA does not mention the recently-completed joint hatchery review by National Marine Fisheries Service and the California Department of Fish and Game (National Marine Fisheries Service and California Department of Fish and Game 2001), or how the results may pertain to the operation of the hatchery. We recommend that the results and conclusions of that study be included in the analysis of hatchery operations.

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United States Department of the Interior

NATIONAL PARK SERVICE
Columbia Cascades Support Office
909 First Avenue
Seattle, Washington 98104-1060

IN REPLY REFER TO:

Mr. Todd Olson
Relicensing Manager
PacifiCorp
825 Northeast Multnomah
Suite 1500
Portland, OR 97232

Subject: Klamath River Project (KRP), FERC #2082, Comments on Draft License Application

Dear Mr. Olson,

The National Park Service (NPS) submits the following comments on the *Klamath River Draft License Application (DLA)* under FERC regulations 18 CFR Section 16.8(b)(4). Under the National Park Service Organic Act (39 Stat. 535), Outdoor Recreation Act (Pub Law 88-29), the Wild and Scenic Rivers Act (Pub. Law 90-542), Council on Environmental Quality Guidelines (45 FR 59190-59191) and Federal Energy Regulatory Commission Guidelines the NPS is authorized to provide technical assistance for recreation planning in the licensing of hydropower facilities. It is the policy of the NPS to represent the national interest regarding recreation, historical and archaeological values, land management, and aesthetics. NPS strives to assure that hydroelectric projects subject to re-licensing recognize the full potential for meeting present and future public outdoor recreation demands while maintaining and enhancing a quality environmental setting for those projects.

Thank you for the opportunity to review the draft license. Harry Williamson and I both reviewed this document. These comments are based on our review of the DLA, our participation in KRP Collaborative meetings during 2001-2003, site visits, and the recreation flow analysis study.

Recreation Resource

Exhibit E

- ❖ Protection, enhancement, and mitigation measures have not been developed yet, we anticipate working collaboratively with PacifiCorp, and other stakeholders to develop these PME's.
- ❖ **Section E7.1.1.1, Recreation Resource Area** – Within the Upper Klamath River/Hell's Corner Reach there are six "fishing access areas" which were voluntarily provided by PacifiCorp, yet are not associated with the current license. Two of the access areas (# 6 and #1) are popular take-outs for commercial and private boaters. The Needs Analysis identified Access Area #6 as a candidate for further development should Stateline campground be replaced. NPS recommends that the fishing access areas be included within the project boundary and that final PM&Es provide for operations and maintenance of the areas.
- ❖ **Table E7.1.1** – Please add the acceptable and optimal ranges for "technical whitewater boating" per Phase 1 & 2 of the whitewater flow studies for the J. C. Boyle Bypass Reach. Under certain

operational regime alternatives, such as run of the river, technical boating may be the only type of boating opportunity.

- ❖ **Section E7.1.3.2, Existing Recreation Demand in Project area.** The City of Klamath Falls' Veteran's Memorial Park/Boat Launch and Link River Trail are shown as being the sites with the highest use measured in recreation days (RD). NPS supports the ongoing collaboration between PacifiCorp and the City toward improving these urban recreational opportunities. We are especially supportive of the City's plans to connect the two facilities with a pedestrian/bike trail, which safely negotiates the arterial road and highways crossings.
- ❖ **Section E.7.2.11 Federal and State Agencies and Tribes with Recreation Management Responsibility in the Project Vicinity.** NPS also shares management responsibilities with the Klamath National Forest under Section 7, 2a(ii) of the WSR Act for the Lower Klamath River (below the project).
- ❖ **Section E.7.4.2.4, Recreation Needs Analysis, Non-motorized Trails.** The Link River trail is one of the highest participation facilities in the project area. Re-surfacing, vegetation management, and incorporating river access of the Link River Trail and other measures identified by the City of Klamath Falls should be added to the list of recreation improvements needed for this trail. Partnering with the City and community on upgrades for this popular trail provides a unique opportunity for collaboration. Other appropriate trail opportunities identified for the City should be included in the potential new trail routes. BLM's draft river management plan proposes several road closures. In coordination with BLM, these roads should be evaluated as potential trail routes. The results of the phase II trail study were not completed in time to be incorporated into the draft application. NPS is supportive of the work completed under this study, and in particular of the 8.5 miles trail and pedestrian bridge along the WSR section of project. NPS is also supportive of the scouting trails for whitewater boating. We believe that both river and reservoir trail opportunities should be included in the final license application.
- ❖ **Section E7.6.1, Flow –Related Project Effects on Recreation Resources.** We disagree with the statement: "In general, normal Project operations appear to have only minor effects on recreation resources in the Project area". In Section 7.6.1.4 it is acknowledged that "the commercial rafting outfitters from this area have established businesses based on the flow regime resulting from load-factoring operation". These two statements are in conflict. NPS agrees with the latter statement. Whitewater boating and angling opportunities are dictated by the operation of J. C. Boyle powerhouse in the Hell's Corner reach. PacifiCorp load-following (peaking) regime is, in large part, responsible for the success or failure of commercial rafting in the area.
- ❖ **FERC Boundary.** The existing FERC boundary does not represent the extent of PacifiCorp's lands, recreation facilities, river corridors, and access roads. The proposed boundary changes more accurately depict the project and its related facilities, however the road below J.C. Boyle Powerhouse is not included in the new boundary. This access road is used by the public to access the project and should be included in the boundary.
- ❖ **Recreation Resource Management Plan.** We recommend expanding this plan to include a visual and aesthetics resource enhancement program. These two resources are closely related and many of the viewpoints in the project are from recreation areas, so including a visual enhancement program in the recreation management plan would be appropriate.

Draft Technical Reports

1. Recreation Flow Analysis

- ❖ NPS commends PacifiCorp on its commitment to conduct a comprehensive, professional recreation flow analysis. We participated in most of the preliminary field work and on-river studies conducted by Confluence Research and Consulting in their Phase 1 and 2 efforts. The study plans were well conceived and developed collaboratively with the Recreation Work Group. Both study phases were well planned and well executed. Preliminary study results were shared with the work group before being finalized. Although the “fishability” aspects of the studies were not as detailed and representative, we believe that the study did draw some valuable conclusions regarding angling opportunities under various flow levels. We place a very high level of confidence in Dr.s Whittaker and Shelby’s work in the area of recreation flow analysis. Accordingly, we place considerable confidence in the results of this study and will be expecting the PM&Es to draw heavily from the conclusions of this analysis. Whitewater boating and angling are the most popular recreation opportunities in the Project, especially in the Hell’s Corner reach, and NPS intends to support the continuation of these activities under the terms of the new license.

- ❖ This report thoroughly describes the results of Phase I results, but the phase II results were not completed in time to be incorporated into this report. NPS looks forward to reviewing the phase II results for the bypass reach, Hell’s Corner reach, Keno reach, Link River, and Copco II. This report identifies issues related to the timing of flows in Hells Corner. Recreation, in particular whitewater boating and trout fishing are outstanding remarkable values of the 11-mile WSR River of which Hell’s Corner is a part. The majority of the whitewater boating use is commercial rafting. The use on the river has declined since the river was designated in 1994, primarily due to the change in timing of flows. These effects of timing, duration, and amount of scheduled releases can create major scheduling problems and possible financial impacts for commercial outfitters. Private boaters and fishermen are less impacted due to their ability to adapt more easily. PacifiCorp should include a commitment to the timing, duration, and amount of schedule releases as part of the final application.

2. Recreation Visitor Survey

- ❖ NPS was disappointed that our agency, and others, were not consulted during the initial development of the survey instruments and methodologies prior to their being used in the field. However we did eventually review them and PacifiCorp’s consultant, EDAW, was very forthcoming about how the surveys were being conducted. Generally speaking, we are satisfied with the results of the survey. We are generally in agreement with their conclusions relative to population and demographic trends in the project vicinity and agree that the vast majority of recreation use emanates from the immediate two-county area.(Klamath County in Oregon and Siskiyou County in Ca). We continue to disagree with the characterization of certain trends depicted in Table 3.7-40. Unfortunately the CA State Comprehensive Outdoor Recreation Plan lumps whitewater boating (kayaking & rafting) in with “rowboating, canoeing”, and other flat-water activities. We do not agree with the SCORP’s conclusion that whitewater boating will experience only “slight increase” in use in the future. This conclusion is counter-intuitive to what we see happening in northern California and southern Oregon

- ❖ It is important to note the visitor survey results from the Projects reservoir, particularly Iron Gate Reservoir. These results have significant implications for planning for those areas. Generally it is found that visitors are satisfied with the current level of development of campgrounds and day-use areas (with the exception of desiring better restroom facilities and providing showers), don’t see crowding as a problem, and cite few instances of user conflict. There is also an overwhelming resistance to paying for facilities, particularly at Iron Gate. NPS has participated in several site visits

led by EDAW and the licensee and has engaged in reviews of conceptual site planning for several campgrounds and day-use areas on the Project. We are supportive of the licensee's commitment to improve existing developments while taking a phased approach relative to expansion and initiating a fee structure. There is a potential for considerable money to be spent on "social engineering" experiments on this Project to mitigate for perceived user preferences. We fully agree with the licensee, and EDAW, that a considerably higher level of managerial oversight and enforcement on the Project's reservoirs is needed to protect resources and more adequately segregate overnight and day-use use. NPS will continue to work closely with the licensee as specific PM&E's are developed for the Project's recreation areas.

- ❖ **Table 3.7-40** also shows two activities, wildlife viewing and hiking, as activities that will increase drastically -- over seven percent in the State of Oregon where the majority of the project area lies. However the largest projected use is 1.2 percent. This does not seem to adequately reflect the potential increase in these activities. In addition, please include biking as an activity in this table.
- ❖ **Section 3.7.3.4, Regional Context.** Table 3.7-41 illustrates the estimated projected recreation use in the study area through 2040. The projected use categories identified are minimal increase (0.0 to 0.6 percent), slight increase (0.7 to 1.2 percent), and increase (greater than 1.2 percent). The table only shows the lower range value for slight increase and increase and the middle value for minimal increase. Please modify the table to show either the mean value or the full range of potential increases.
- ❖ **Section 3.7.3.2, Trends in Recreation Activities.** Table 3.7-40 identifies the projected increase for recreation activities in the study area based on National and California and Oregon State studies on projected use and trends. For the activity of whitewater boating, the national study shows an increase of 1.18%, CA-study -4.81%, and OR-study 5.95%; the resulting study area projection was a 'slight increase' (ranging from .7 to 1.2 percent). For the activity of RV camping, the national study indicates an increase of 1.07%, CA-study -4.19%, and OR-study 4.57%; the resulting study area projection was a 'increase' (greater than 1.2 percent). Please clarify, why the national and state studies show a similar increase for these two activities, yet the study projection is different.
- ❖ **Tables 3.7-31 & 3.7-32 Recreation Use Levels in the Project Area.** We recommend an expansion of this table to include data for Middle Klamath (Iron Gate to the Salmon Confluence). Much of this data could be collected from existing agency records on the reach.

3. Recreation Needs Analysis

- ❖ The Recreation Needs Analysis represents a synthesis of the recreation supply and use/demand studies. The Recreation Resources Management Plan will incorporate PM&Es which are derived from this analysis. The licensee and EDAW have been reporting and discussing the results of the needs analysis during recent Recreation Work Group meetings. NPS has participated in those discussions and our experience is that EDAW has been very responsive to incorporating our, and other stakeholders', comments in subsequent revisions. We are in general agreement with the results of those efforts.
- ❖ The results of the phase II flow analysis and trail study need to be incorporated into the needs analysis.
- ❖ Wildlife viewing, interpretation and education, hiking were all identified as high participation activities in the project area and the CA & OR SCORPs. These opportunities were also identified in

the needs analysis. When identifying locations for these opportunities, consideration should be given to providing both river and reservoir opportunities.

- ❖ **Law Enforcement and Management.** There is a need for increased law enforcement and management at most of the sites in the project. Natural and cultural resource issues dominate these reasons in the river corridor areas. Increased patrols and management could be a tool used to better balance the resources in the basin. While potential facilities improvements and management changes (i.e. fee implementation) dominate the justification for increased management and enforcement in many of the reservoir areas. A law enforcement and management plan should be developed as part of the final application or new license.
- ❖ **Keno River Reach.** The Keno river reach was a part of the phase I and phase II (to be completed) flow analysis study. However, this reach was not included in the needs analysis. Please incorporate this reach into the needs analysis.
- ❖ **J.C. Boyle Bypass Reach.** The J.C. Boyle bypass reach was also included in the flow analysis study, but was not incorporated into the needs analysis. Needs for this reach include providing a put-in below the dam, providing appropriate weekend releases for whitewater boating opportunities, and providing accurate real time flow information and projections to allow boaters to take advantage of natural spill information.
- ❖ **Group Camping and Day-use Facilities.** The recreation surveys revealed a pronounced latent demand for group facilities. This is generally backed up by the California and Oregon SCORPs and national trends (Cordell's "Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends", 1999). We recommend that the licensee pursue its plans for group facilities such as the group campground proposed for Long Gulch on Iron Gate Reservoir and other group facilities proposed at existing facilities throughout the Project.
- ❖ **Toll-free flow phone and website flow information.** – PacifiCorp should continue to maintain these flow information mediums. PacifiCorp should display USGS flow gage information on website (may be integrated into American Whitewater's website). Commercial rafting outfitter would benefit from more reliable, contemporary flow forecasts.
- ❖ **BLM's Klamath River Campground.** – Additional campsites are shown to be needed. Enhancements such as more formalized sites, restrooms, etc. should be provided by PC and they should share in O&M costs for the site.
- ❖ **Stateline Take-out** – Studies demonstrated that facility is at capacity much of the time. Campsites on the lower bench should be formalized and new campsite capacity developed on the upper bench. On page 5-22 the applicant states that this facility is in "good condition", this is clearly not the case. The access road down to the take-out is frequently inundated due to seepage from the irrigation canal above – road should be hardened and seepage should be mitigated. More permanent restrooms with changing facilities should be provided.
- ❖ **Fishing Access #6** – PC should provide higher level of O&M, better restroom facility, and formalize trails to fishing areas.
- ❖ **Frain Ranch** – In dire need of improvements to restroom, general maintenance, and law enforcement. Roads should be closed and/or rehabilitated to protect sensitive cultural sites and natural resources. If the trail system is extended to include a pedestrian bridge across the river to Klamath River campground, O&M could be more easily provided.

- ❖ OHV use in the Klamath River corridor particularly near Frain Ranch has caused damage to valuable natural and cultural resources in the area. Increased management of this use is needed. If this opportunity is eliminated or reduced in the river corridor, replacement of OHV use is needed elsewhere in the project vicinity. NPS is supportive of replacing this OHV use in a more acceptable location. Since OHV use is already occurring in Sportsman Park, expansion of this area has been identified as one possible solution.

Land Management and Aesthetics

Exhibit E

- ❖ **Section E8.1.2.3, Project Facilities.** This section states that several project facilities are inconsistent with BLM's designated VRM classification for the area (VRM classification's II and III). As part of the new license protection, mitigation, and enhancement measures should be implemented to ensure that the project facilities are consistent with the visual designation of the area. Characterization of visual attributes of the dams and transmission lines should clearly state that they are dominate features that significantly contrast the natural appearance of the river canyon. The fact that the facilities exist would not exempt them from reasonable changes that would enhance the visual experience of visitors to the area.
- ❖ **Table E8.1-2. Summary of Visual Resource Analysis.** We see value in completing a comparative analysis of aesthetic flow to a baseline flow for the river reaches and base lake level for the reservoirs in the project-affected area.
- ❖ **Section E8.3.1, Agencies and Tribes with Land Management Responsibility.** NPS also has some management responsibilities of the Lower Klamath River, under the Wild and Scenic River Act. Also, Oregon Parks and Recreation Department should be included in this table, since they have management responsibilities for the Klamath under the Oregon State Scenic Waterway program.
- ❖ **Table E8.3-3, Land use and resource management plans that were reviewed and determined to be not applicable.** When a river or river segment is determined eligible for inclusion in the WSR system, the river needs to be managed to protect and enhance the outstanding remarkable values identified in the report. Therefore, while not directly a 'management plan', the reports listed in this table that are related to the Klamath River's eligibility need to reviewed for consistency.
- ❖ **Section E.8.6.2 Proposed Measures for Aesthetic/Visual Resources.** As part of the final application PacifiCorp should include PME's for aesthetics. A plan should be developed that addresses the entire project-affected area. Many of the facilities are currently inconsistent with BLM's VRM classifications and could be enhanced to better meet the goals of Siskiyou County and the City of Klamath Falls. The mitigation package should include vegetative screening and other appropriate measures to screen major project facilities including the dams, powerhouses, transmission lines, access roads, etc. In addition, vegetation screening and landscaping should be considered at the recreation sites and developments. Landscape guidelines should also be developed to ensure that new project facilities and upgrades are consistent and blend in with the natural landscape. Mitigation measures should include enhancement of the river corridor and reservoir shoreline buffer zone. And enhancement of visual quality, through the development of scenic overviews. PacifiCorp impact on water quality should be determined and addressed as part of the aesthetics plan.

Future Study Needs.

Additional studies may need to be conducted to address the affect that any future changes in the operation have on recreation in particular whitewater boating and fishing, and the corresponding effects on the socioeconomics of the area.

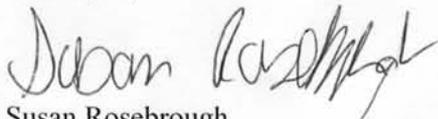
Wild and Scenic River (WSR) Assessment.

The BLM, U.S. Forest Service, and the NPS will be completing a WSR assessment on the designated and eligible river segments affected by the project. Specific WSR values and their potential affects have been previously identified and communicated to PacifiCorp. The final application include the information identified in the "Crosscutting Issues – Wild and Scenic River Assessments" paper as Attachment 1 below). This paper was presented to the Plenary in April 2003.

NPS is currently awaiting the results of ongoing water quality and fishery studies to determine the extent to which KRP has contributed to conditions below Iron Gate. If it is determined that significant impacts resulting in the diminishment of ORVs or water quality on the Lower Klamath River can be attributed to the Project, we will be making specific PM&E recommendations accordingly.

NPS will continue to actively participate in the relicensing process and continues to work cooperatively with your staff to develop PME through the development of the Recreation Resource Management Plan. If you have any questions regarding our response, I can be reached at 206-220-4121 and Harry Williamson can be reached at 916-978-4316.

Thank you,



Susan Rosebrough
Northwest Hydropower Relicensing Coordinator

CC:

Bill Betterberg (via e-mail)
David M. Diamond (via e-mail)
Gary Frey, Argonne National Lab (via email)
Dan Hirschman, USBIA (via email)
Barbara Machado, BLM (via email)
Scott Senter, BLM (via email)
Jerry Mosier, UDSA FS (via email)
Robbie Vandewater, USDA FS (via email)
Phil Dietrich, USFWS (via email)
Alan Schmierer, NPS (via email)
Jan Houck, Oregon Parks & Recreation Dept. (via email)

Attachment 1

Klamath River Project *Cross-cutting Issues – Wild and Scenic River Assessments* **Presented to KRP Plenary on April 10, 2003**

Three reaches of the Klamath River will be assessed relative to the project's impact on the designated, or eligible WSR reaches, within or directly below the project.

Oregon: Hell's Corner Reach (JC Boyle PH to Stateline) – designated in 1994
Stateline to Copco – BLM determined to be eligible as a WSR

CA: Below Iron Gate to mouth – designated in 1981

BLM will conduct WSR Act Section 7 Assessment for Oregon reaches

"Hydropower Project is in the WSR Corridor" Standard: The project must not "directly and adversely affect" the values for which the WSR was established ("outstandingly remarkable" values, free flow and water quality).

FS and NPS will conduct WSR Act Section 7 Assessment for CA below Iron Gate "Hydropower Project is outside the WSR corridor, upriver" Standard: The project must not "Invade the area or unreasonably diminish the 'outstandingly remarkable anadromous fisheries, free flow, water quality, scenic, recreational, or wildlife values of the WSR"

Outstandingly Remarkable/WSR Values:

Oregon WSR – Free flow, Water Quality, Fisheries, Recreation (primarily recreational whitewater boating and angling), Scenic Quality (river's flow character, water clarity & quality including excessive algae/scum, riparian vegetation, terrestrial & aquatic wildlife), North American Traditional Uses, Historic Sites, Wildlife

California WSR – Free flow, Water Quality, Anadromous Fisheries (coho, Chinook, steelhead), Secondary values with WSR Act protection include Recreation (primarily angling, whitewater boating and waterplay), Scenery (river's flow character, water clarity & quality including excessive algae/scum, riparian vegetation, terrestrial & aquatic wildlife), and Wildlife.

The BLM and FS/NPS will also examine Section 10 of WSR Act:

- **Section 10:** Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its aesthetic, scenic, historic, archaeological, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area. (BLM's River Management Plan is due to be released this Spring). Applicable management plans for the CA

reaches include the Klamath and Six River National Forest Plans, and corresponding management plans for NPS administered WSR segments.

What the Recreation work group needs from other work groups:

- Description of how the project has affected conditions for any of the above ORV's, within and downstream from the project since their designation.
- Description of how the project has affected water quality and free flow of the river within and below the project since their designation.

What the Recreation work group, and probably several other work groups, need from PacifiCorp:

BLM, FS, & NPS request that the Draft Application include a discussion of how Klamath River values protected by (or eligible for protection by) the WSR Act have been influenced by the project's historic operational influences, particularly before and after the following time periods:

- Construction of Iron Gate in 1962
- Shift toward "peaking" operations since mid- 90's
- CA WSR reach was designated in 1981
- OR WSR reach was designated in 1994

The main WSR resource values that need to be assessed are: free flow, water quality, fish, wildlife, recreation and scenery (see OR values section for details).

The baseline to for the Section 7 assessments are dates of designation, which are then applied to determine trends and assure sustainability of protected WSR values.

Justification:

This information is needed to conduct the Section 7 WSR assessment. This assessment is needed before a license is obtained from FERC.

Comments of the Office of Policy Analysis

Initial Statement

Page 1: PacifiCorp requests a new 50 year license. Given that there are no significant new investments proposed in this draft license application, and that it is the Commission's general policy to establish 30-year terms for projects with little or no redevelopment, new construction, or extensive environmental mitigative and enhancement measures¹, it appears that a thirty year license term is more appropriate.

Executive Summary

Page 2-1 and 2-2: The application contents section does not accurately describe the contents of this draft. For example, this section states that Exhibit D contains operations and maintenance costs for operating the Project and any proposed modifications (it does not, see Exhibit D, Page 2-1). Similarly, this section claims that Potential Project impacts are described and protection, mitigation, and enhancement measures are presented in Exhibit E, when this is not the case (See for example Exhibit E, Page 1-1).

Page 4-3: The application states that upstream fish passage facilities currently exist at J.C. Boyle, and Keno, and Link River dams. The application further states that the purpose of these facilities is to allow the passage of resident fish to the Upper Klamath River and also to provide spawning access to certain tributaries. The text does not make any statement regarding the effectiveness of the existing facilities in achieving their purpose.

Page 4-4: The collaborative technical workgroups did work constructively to design study plans. However, basic information requests from the First Stage of consultation were never resolved in the key areas of aquatics and fish passage. The final application needs to identify disagreements regarding study methodology, and accurately record where PacifiCorp conducted studies prior to workgroup approval.

Page 10-1: The DLA refers to “the Tribes, agencies and non-governmental organizations collectively known as TANGO.” TANGO is a loose affiliation of process participants that meets periodically to exchange information. TANGO is not a decision-making group. It is incorrect to attribute positions to TANGO.

While not attributable to TANGO, it is true that in meetings in January and February 2003 many relicensing participants, including the Department, made it clear that PacifiCorp should provide the following information in the draft license application. The Department and others specifically called for the draft license application to 1) identify PM&E measures proposed or provisionally being considered, 2) complete an array of Project scenarios, 3) include a complete summary of knowledge to date of studies, literature reviews, and peer reviewed documents, 4) provide the current status of studies and preliminary results, 5) identify the proposed FERC Project boundary and study areas

¹ See for example *Rhineland Paper Company*, 104 FERC 62,134 at ¶45.

of Project effects, and 6) identify PM&E measures that PacifiCorp is not considering and the reasons why (See Plenary Meeting Notes, January and February 2003).

Page 10-2: The Department shares PacifiCorp's hope that the collaborative group will be productive over the next months reviewing study results and model outputs, identifying and filling in data gaps and jointly developing PM&E options. The discussion regarding potential PM&Es would be greatly assisted if PacifiCorp would provide information and positions to supplement the draft application, including a proposed project, and the elements requested above in the time remaining before the final application.

Exhibit B

PacifiCorp states that Exhibit B is "intended to provide general information that may help participants interested in the relicensing of PacifiCorp's Klamath Hydroelectric Project ("Project") better understand how and why the Project is operated as it is."

Unfortunately, the draft application lacks key elements required by 18 CFR 4.51(c), including a statement of how the project will be operated during adverse, mean, and high water years; estimates of the dependable capacity for the various facilities, curves showing powerplant capability versus head and specifying maximum, normal, and minimum heads; and statements, with load curves and tabular data, if necessary, of the manner in which the power generated at the project is to be utilized, including the amount of power to be used on-site, if any, the amount of power to be sold, and the identity of any proposed purchasers.

PacifiCorp needs to provide an updated draft Exhibit B that includes this critical missing information.

Exhibit C

Before filing the final application, PacifiCorp needs to provide an updated draft Exhibit C by adding proposed facility changes that will constitute PM&E measures, in order to meet the requirements of consultation in 18 CFR 16.8.

Exhibit D

PacifiCorp chose not to estimate, or make any attempt to bracket a range of capital and O&M costs for project modifications and enhancements in the draft license application. This section does not meet the requirements set in 18 CFR 4.51(2)(e).

Page 5-1: Estimated annual value of power

PacifiCorp provides no estimate of the annual value of project power. There is no explanation why no estimate is provided. Since the calculation is not completed, it is difficult to assess the methodology described, but it appears to be inconsistent with the project replacement cost calculation on Page 6-1.

In addition, the levelized value of power should be calculated for 30 years regardless of the license term (See *Workshop on Evaluating the Economics of Hydroelectric Projects at FERC*, Office of Hydropower Licensing, February 3, 1998). Finally, with interest rates at historic lows, PacifiCorp needs to demonstrate that their cost of capital is so high as to justify a 7.5% discount rate.

Page 6-1: Alternative Power Sources

The calculation of replacement costs needs improved documentation and explanation in the final application. The calculation of the annual replacement cost should take in to account that value of generation can vary significantly between peak and off peak times. In this presentation, PacifiCorp averages wholesale prices over thirty years that were calculated in the Integrated Resources plan as a blend derived from near-term forward prices from the market and long-term fundamental price scenarios simulated in the MIDAS model. The final application should include information on historic peak and off-peak generation presented in hourly time-steps.

The wholesale market estimates from the Integrated Resources Plan are based on system level assumptions. Regardless of the hydroelectric outcomes on this project, PacifiCorp will need additional generation over the next decade to meet load. PacifiCorp will need to add about 4,100 MW of new capacity to be built, secured by contract, purchased in short-term markets, or offset by demand-side management and energy efficiency programs. The analysis in the final application needs to be more tailored to replacing the specific capacity and production of the Klamath facility. It may be that replacing about 150 MW from this project would fall within the planned reserve margins, and therefore the replacement cost would just be the O&M costs of production at the new capacity that PacifiCorp will be obtaining in any event over the next ten years.

PacifiCorp provides rough estimates of replacement costs for natural gas, cogeneration, and wind. Since the relevant replacement cost for the relicensing analysis is the lowest-cost alternative, PacifiCorp should also provide estimates for replacement with long-term contracts, coal facilities or any other low cost alternatives.

Page 7-1: In the final application this section should be removed. 18 CFR 4.51(e) does not require an analysis of the consequences of license denial in Exhibit D, and the analysis presented here is so cursory that it does not offer additional value for readers. Similar information is presented in greater detail in Exhibits E and H (although as noted below, the Department would like to see a more comprehensive assessment of the effects of the proposed project and the alternatives thereto in the final application). The Department hopes that the consequences to the entire range of interests and resources affected by the decision to relicense the project will be the focus of the entire licensing process, including FERC's NEPA documents and the license order.

Exhibit E

Page 1.1: PacifiCorp states that: “The change in the level of collaboration during the second stage has extended the timeline on adopting and executing study plans; therefore, many studies are not yet completed.” This statement is incorrect. In fact, it was recognized that PacifiCorp was well behind schedule at the time of the initiation of the process protocol: “On December 6, 2001, PacifiCorp met with stakeholders to discuss the relicensing process to date. Stakeholders voiced their concerns that the relicensing process was not proceeding in a timely manner and would not result in a comprehensive technical/scientific record adequate to meet the needs of all Participants and to form the basis of the draft application, proposed License Terms and Conditions, Protection, Mitigation and Enhancement measures (PM&Es) and/or tribe and agency recommendations / prescriptions.” (Process Protocol, page 1). For this reason, the process protocol divided tasks into phases, with a priority placed on expeditious resolution of time sensitive study plans. Many studies eventually agreed to the collaborative were already proposed by agencies at FSCD. The change in the level of collaboration was a welcome development, and the Department hopes that this collaboration will continue to be productive. Nevertheless, given that PacifiCorp is following the traditional licensing process regulations, and first stage and second stage consultation must be completed.

PacifiCorp states : “Given the outstanding status of some studies and the need to address Project impacts and PM&Es more collectively, this draft Exhibit E does not address PM&Es or continuing project impacts as is usual in the second stage of the licensing process. Outstanding study results, Project impacts, and probable PM&Es will continue to be discussed with stakeholders on a monthly basis while this draft Exhibit E is being reviewed and while the final Exhibit E is being developed.” This statement is a mischaracterization of the FERC licensing process. The collaborative process is “meant to augment, but not supercede, the duties and responsibilities set forth in the Traditional Licensing Process as identified in the Code of Federal Regulations (CFR’s), specifically 18 CFR Part 4 and 16.” (Process Protocol, page 1). In the traditional licensing process, the applicant provides a draft application in order to complete consultation with resource agencies and other stakeholders. To date, substantive discussions of project impacts and PM&Es have not taken place. The stakeholder work groups remain committed to finalizing study plans, reviewing results, identifying additional information needs, and developing PM&E options.

Comments on Exhibit E - Socioeconomics

PacifiCorp has conducted one socioeconomic study and proposes to conduct two additional ones in support of its application. The first study describes the existing socioeconomic conditions in the region of the Klamath Project. In the second, termed Phase 2, PacifiCorp proposes to examine the changes in the region’s socioeconomic condition for each landscape option defined by the Plenary Workgroup. In the final study, Phase 3, PacifiCorp intends to conduct a regional economic impact analysis of its proposed project, as well as a national-level benefit-cost analysis.

Page 9-2: E9.1.1 Characterization of Existing Conditions.

The first study is a conventional, albeit credible description of the existing socioeconomic conditions in the region of the Klamath Project. The study provides a profile of the population, nature of the housing stock, employment by county and industrial sector, and the traditional income statistics. The study, however, reveals nothing about PacifiCorp's effect on the region, its economy or environment beyond the extent of PacifiCorp's employment and payroll in and tax contributions to the region (E9.1.1.4). In fairness it is not designed to; Phases 2 and 3 are intended for those purposes.

The concern with section E9.1 and the narrative regarding current conditions has to do with the subtle implication rather than an explicit contention that these conditions (whether desirable or worrisome) are due in part to PacifiCorp's project. This may well be so, but Phase 1 is a narrative of facts, not a test of effects. PacifiCorp should be at pains in section E9.1 not to take responsibility for or credit for any of the region's conditions. For example, one cannot determine from Phase 1 whether the sizable recreational economy is due to the Project; what the composition of the recreational sector would be in the absence of the project; whether it would expand or contract; and what direct, indirect, and induced economic effects an altered recreational sector would have associated with it. PacifiCorp should provide a disclaimer to this effect early in section E9.1, and avoid statements like the following which, however unintentionally, are subject to misinterpretation:

The draft Phase 1 socioeconomic study describes the existing socioeconomic condition in the study area *as it relates to the current Project ...* (E9.3.1, paragraph 2, first sentence. Emphasis added).

The discussion of recreation is a particularly noteworthy example of this concern. The narrative in this section clearly implies that the Project enhanced whitewater recreation and *may* have had a deleterious effect on in-stream and ocean fishing. Again, there is no way to make that determination from the data presented. One must do a test, a simulation, a with-and-without- project analysis to estimate Project impacts. Aaron Douglas has done such an analysis of recreation for the US Geological Survey, concluding that the net present value of the benefits of restoration of the Klamath River Basin is \$15B. PacifiCorp cited this work in the bibliography of both Exhibit E, and the DTR, but did not discuss it anywhere in the text. PacifiCorp needs to include a full discussion in the final application.

Page 9-8: E9.3.3 Proposed Studies

The proposed Phase 2 and 3 studies are the key socioeconomic studies. Conceptually they could provide the necessary information to estimate the Project's effect on each landscape option selected by the Plenary Group. One's confidence that these studies will fulfill their promise is eroded, however, by the detailed discussions in the draft application of study design and methodology (DTR 3 and 4).

Phase 3 regional analysis: The design and methodology for the regional economic analysis portion of Phase 3 is well-defined. However, this is arguably the least

interesting of the studies which comprise Phases 2 and 3, consisting as it does of an assessment of the regional impact of PacifiCorp's proposed project. Since PacifiCorp intends no changes from the existing project other than the PM&Es, the Phase 3 regional analysis is limited to an estimation of the regional economic impact of the PM&Es.

This, of course, is not the principal intent of the relicensing process. The statutory purpose of the relicensing process is to determine whether an existing project should be granted a new license. To answer that question, one has to examine the project as a whole, not just the proposed changes in the project (in this case, the PM&Es). FERC is charged with determining whether the project is in the public interest, i.e., whether the public benefits from the project being relicensed and operating relative to not having the project (the decommissioning or no-project alternative). Hence, any meaningful analysis must involve a comprehensive assessment of the socioeconomic effects of the proposed project and the alternatives thereto in their entirety, not just an estimation of the effects of modifications in the current project.

A second concern arises because this is a regional analysis. Regional analyses can be highly misleading because, as their name implies, they measure regional contributions to income and output, not national contributions. Increases in income and output in one region are frequently offset by decreases in another. Thus, there is always the potential with regional economic analyses for the effects to seem more significant than they are. We hope that PacifiCorp will avoid this trap in interpreting the results of the regional economic analysis in Phase 3.

The skepticism regarding the results of regional analysis can be expressed succinctly: Economic benefit compared to what? That is, what is the opportunity cost of the resources used to generate the new, regional, economic activity. For example, if there were unemployed resources in the region in the previous period, and hence no apparent opportunity cost to employing them to produce new output in the region in that period, one cannot assume that these resources would have continued to be unemployed in the future. One still has to ask what might these resources be doing in this period or the next period. Would they have been idle for a long period? If so, then their opportunity cost in the production of something new regionally is low or zero, and the gross output equals the net output equals the net benefit. But if they would have been employed elsewhere (either regionally or nationally outside the region), then only the marginal gain over and above their alternative earnings constitutes a net benefit.

Since PacifiCorp plans a national-level benefit-cost analysis as a component of Phase 3, the above concerns about the tendency to exaggerate the importance of regional effects could be allayed. The analyses differ ... one is macroeconomic in character the other microeconomic, but the benefit-cost analysis would still serve to clarify and temper the results of the regional analysis. Unfortunately, the study design and methodology for the national-level component of Phase 3 is still in the planning stage. DTR 4 identifies the benefits and costs to be measured, lays out the theoretical basis for their measurement, but makes it clear that the specifics of the methodology have not yet been determined (DTR 4, page 4-15 and following). Given that the application is due in less than six

months, it will be difficult to do a credible job on such a potentially complex problem. Since we are dealing with a moving target, it's difficult to comment beyond express concern. Although the Plenary Workgroup has defined the high-level options, the nature of the studies to measure the effects of these options is still being discussed in the collaborative workgroups. Studies have not been scoped, and the extent to which nonmarket and environmental effects will be quantified and/or monetized remains in doubt (DTR 4, pp. 4-15 to 4-19).

Finally, by its very nature the limited geographic scope of the region restricts the magnitude of the nonmarket benefits. The Klamath is a river of national significance. Historically, the basin supported one of the most productive salmon fisheries on the west coast of the United States with annual runs on the order of 500,000 to one million fish. It was second only to the Columbia River and Central California river systems in its productivity. Runs are now a small fraction of their original numbers, and commercial fishing has been reduced to a token. The active and passive values of the potential, non-power benefits of the river are undoubtedly much larger nationally than regionally.

Phase 2: Throughout the past year of collaborative meetings, PacifiCorp has consistently maintained that it had no intention of assessing the no-project alternative. Given that PacifiCorp was seeking a new license, management saw no point in the brief time remaining to complete the application to devoting any of the limited resources available for studies to assessing the decommissioning option. PacifiCorp maintained this stance despite repeated assurances from the participating stakeholders that a comprehensive with-and-without-project analysis was necessary independent of whether decommissioning was a consideration. The issue was estimating the effect that the Project had on the various resource categories: recreation, cultural, water quality, aquatic, wildlife and botanical, geomorphic, hydrologic, etc. In the absence of such a with-and-without analysis there is no way to determine the Project's impacts and to craft appropriate PM&Es.

It was thus with some gratification that we greeted PacifiCorp's announcement in the draft application that in Phase 2, PacifiCorp would examine the changes in the region's socioeconomic condition for each landscape option defined by the Plenary Workgroup. PacifiCorp is to be commended for this effort. Unfortunately, although PacifiCorp has committed itself to examining the Projects effects for each landscape option, the language in the draft application suggests that the analysis of the array of options will be less detailed than that for the proposed project. Question 4 for Phase 2 indicates that PacifiCorp intends to determine the "expected direction and economic significance" of each option for market and non-market benefits and costs (DTR 3.1, page 3-1). We suspect that the contrast between that language and the corresponding language for question 4 for Phase 3 (determine the "changes in market and non-market" benefits and costs) is not unintentional. This language difference in conjunction with the disparities in the study descriptions in DTR 3 and 4 and the SLOM suggest that the various landscape options will be assessed less rigorously than the proposed project and the results presented qualitatively, while the results of the assessment of the effects of the proposed project will be quantified. As already noted, at this stage the studies for Phase 3 are well-

specified; those for Phase 2 are in development. Given the significance of the Klamath Basin, it is irresponsible to conduct noncomparable studies of the various landscape options.

Exhibit H

Page 3-1: Alternative Sources of Power

See comments for Exhibit D, Page 6-1, above.

Page 3-3: The levelized cost to produce power should be based on a 30 year period, not a 40 year period.

Appendix E-1A Correspondence record

The following entry should be added to Appendix A in the final application:

Organization	Date	How Conveyed	Topic
Department of the Interior	4/8/03	Letter to PacifiCorp	Progress of first stage consultation and prognosis for second stage consultation