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UNITED STATES OF AMERICA 71 FERC 61,159
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Elizabeth Anne Moler, Chair;
Vicky A. Bailey, James J. Hoecker,
William L. Massey, and Donald F. Santa, Jr.

City of Seattle, Washington) Project No. 553-005
U.S. Department of the Interior) Docket No. EL78-36-000

ORDER ACCEPTING SETTLEMENT AGREEMENT, ISSUING NEW LICENSE, AND TERMINATING PROCEEDING

(Issued May 16, 1995)

The City of Seattle, Washington (Seattle), filed an application for a new license, 1/ pursuant to Sections 4(e) and 15 of the Federal Power Act (FPA), 2/ authorizing the continued operation and maintenance of the 689.4 megawatt (MW) Skagit River Project, located on the Skagit River 3/ in Snohomish, Skagit, and Whatcom Counties, Washington. 4/ For the reasons discussed below, we approve the settlement, incorporating those aspects of it over which we have jurisdiction into the new license issued to Seattle.

On April 30, 1991, Seattle filed an Offer of Settlement and eight supporting Settlement Agreements, followed by the filing of two additional Settlement Agreements on September 17, 1993, regarding the application filed in this proceeding. For ease of reference, the filing in its entirety will be referred to as the Settlement Agreement. The individual, supporting settlement

1/ Seattle was issued a 50-year license for the Skagit River Project on October 28, 1927. See Eighth Annual Report of the Federal Power Commission (1928) at 190. Since the expiration of that license in 1977, annual licenses have been issued, with the terms and conditions of the original license, authorizing Seattle to continue project operations pending disposition of its application. The application for a new license was filed in 1977; thereafter, the parties commenced negotiating their settlement.

2/ 16 U.S.C. 807.

3/ The Skagit River is a navigable waterway of the United States. See Seventh Annual Report of the Federal Power Commission (1927) at 76.

4/ Seattle is not proposing to add any new capacity or construct any new facilities.

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agreements will be designated according to the subject of the pertinent settlement agreement (e.g., Wildlife Agreement).

The Settlement Agreement purports to resolve all issues related to project operation, fisheries, wildlife, recreation and aesthetics, erosion control, archaeological and historic resources, and traditional cultural properties. We will incorporate into Seattle's new license all the Settlement provisions which relate to the Skagit River Project, as discussed more fully below.

By notice issued on September 7, 1978, the Commission instituted a proceeding in Docket No. EL78-36 in response to a recommendation by the Department of the Interior for certain changes in project operation. 5/ The purpose of the proceeding was to examine the effects of the project's flow regime on the Skagit River's fisheries resource. On May 12, 1981, the Commission approved an Interim Agreement in that docket which established certain flow regimes for the Skagit River Project and required Seattle to perform further fishery studies. 6/ In the Settlement Agreement, the parties request that the Commission dismiss the proceeding in Docket No. EL78-36. The Settlement Agreement includes and supersedes the Interim Agreement reached in Docket No. EL78-36. Since the issues under review in that docket are resolved by the Settlement Agreement and the issuance of this license, we will terminate the proceeding in Docket No. EL78-36.

I. PROJECT DESCRIPTION

The Skagit River Project is located between river miles 127 and 94 on the Skagit River in Snohomish, Skagit, and Whatcom Counties, near the towns of Diablo, Newhalem, Marblemount, and Rockport, Washington, and approximately 100 miles from the City of Seattle. The project consists of three developments with a total installed capacity of 689.4 MW. The current project boundary encompasses 19,209.25 acres (excluding the project

5/ All the intervenors in Docket No. EL78-36 are signatories to the Settlement Agreement.

6/ See Order Conditionally Approving Interim Offer of Settlement, 15 FERC 61,144 (1981); Order Declaring Interim Settlement Effective and Partially Releasing Condition, 16 FERC 61,044 (1981).

transmission line corridor). 7/ With the exception of the transmission lines, the project is located entirely within the outer boundaries of the 117,524-acre Ross Lake National Recreation Area (Recreation Area), which is administered by the Department of the Interior's National Park Service. 8/ The Recreation Area is surrounded by lands of the North Cascades National Park, and the Mount Baker-Snoqualmie, Okanogan, and Wenatchee National Forests. Project transmission lines cross a portion of the Mt. Baker National Forest and a segment of the Skagit River within the national Wild and Scenic River System.

The three developments comprising Project No. 553 are Ross, Diablo, and Gorge. The Ross Development consists of a concrete arch dam, rising 540 feet from bedrock to crest; an 11,680-acre

7/ Exhibit F of the licensee's application indicates that the project includes 19,304.75 acres of federal lands (both project works and transmission lines). The licensee's Report on Aesthetics, filed with the Settlement Agreement, lists 19,266 acres within the Recreation Area. The application states, in Exhibit W, that only 168.312 acres are private lands (124.75 acres in Newhalem, and 43.56 acres in Diablo). This license requires Seattle to file an account of the acreage in the project, with a precise break-down of the ownership of all lands (federal or private).

8/ The project predates the Park. The North Cascades Park Act of 1968, Pub. L. No. 90-554, 82 Stat. 926, established the North Cascades National Park, the Lake Chelan National Recreation Area, and the Ross Lake National Recreation Area. The Ross Lake National Recreation Area was set aside "to provide for the public outdoor recreation use and enjoyment of portions of the Skagit River, Ross, Diablo, and Gorge Lakes together with the surrounding lands, and for the conservation of scenic, scientific, historic, and other values contributing to the public enjoyment of such lands and waters." 82 Stat. 927. Section 505 of the Act, 82 Stat. 930, amended by 102 Stat. 3963, provides:

> [n]othing in this Act shall be construed to supersede, repeal, modify, or impair the jurisdiction of the Federal Power Commission [predecessor to FERC] under the Federal Power Act (41 Stat. 1063), as amended (16 U.S.C. 791a et seq.), in the lands and waters within the Skagit River Hydroelectric Project, Federal Energy and [sic] Regulatory Commission Project 553, ...; and existing hydrologic monitoring stations necessary for the proper operation of the hydroelectric projects listed herein.

reservoir with a total storage capacity of 1,435,000 acre-feet; two 26-foot-diameter power tunnels, 1,800 feet long and 1,634 feet long; and a power plant with four generating units having a combined nameplate capacity of 360 MW.

The Diablo Development consists of a concrete arch dam rising 389 feet from bedrock to crest; a 770-acre reservoir used primarily for reregulation; a 2,000-foot-long tunnel and two inclined steel pipelines which convey water from the reservoir to the power plant; and a power plant containing four generating units with a combined nameplate capacity of approximately 122.4 MW.

The Gorge Development consists of a combination concrete arch and gravity diversion dam rising 300 feet from bedrock to the crest; a reservoir with a capacity of 8,500 acre-feet; a 20.5-foot-diameter, 11,000-foot-long penstock which conveys water to the power plant and creates a 2.7-mile-long bypassed reach; and a power plant containing four generating units with a combined nameplate capacity of approximately 207 MW.

The Skagit River Project electric transmission system consists of several 230 kilovolt circuits on double-circuit steel towers. The transmission lines terminate a few miles northeast of Seattle. 9/

II. BACKGROUND

In response to the published notice of the application, 10/ timely, unopposed motions to intervene were filed by the Swinomish Indian Tribal Community, the Upper Skagit Tribe, and the Sauk-Suiattle Tribe, jointly (the Tribes); 11/ the National Marine Fisheries Service (NMFS); the Washington State Department of Game (Washington Game); the North Cascades Conservation Council (Conservation Council); the Washington State Department of Fisheries (Washington Fisheries); the Secretary of the Interior, National Park Service (Park Service) and Fish and Wildlife Service (FWS); the Department of Ecology, Washington State (Department of Ecology); and the U.S. Department of Agriculture, Forest Service (Forest Service). The Commission issued a notice granting these motions to intervene on May 15, 1979. The Nlaka'pamux Nation of British Columbia, Canada, filed a late motion to intervene on November 7, 1990; the Commission

9/ Ordering paragraph (B)(2) of this order contains a more detailed project description.

10/ 44 Fed. Reg. 3070 (1979).

11/ These are United States Native American tribes.

issued a notice granting the late intervention on June 27, 1991.

A draft Environmental Assessment (EA) for this project was issued on March 4, 1994. Comments on the draft EA were filed by Seattle, the Park Service, the U.S. Army Corps of Engineers, the Conservation Council, the Nlaka'pamux Nation, NMFS, the Tribes, the North Cascades Institute, and FWS. These comments were considered in preparing the final EA for this project, which is attached to this license order. Background information, analysis of impacts, and the basis of a finding of no significant impact on the environment are contained in the EA. The Commission's staff also prepared a Safety and Design Assessment, which is available in the Commission's public file for this project. All comments received from interested agencies and individuals have been fully considered in determining whether, or under what conditions, to issue this license.

On February 24, 1995, the Sto:lo Nation of British Columbia, Canada, filed a motion to intervene which states, without elaboration, that the Sto:lo Nation's traditional territory extended below the 49th parallel prior to the establishment of that border. 12/ We note that this proceeding began in 1977 when Seattle filed its application for a new license, and that the Settlement Agreement discussed in this order was filed in 1991 and 1993. Various opportunities for intervention or comment have arisen throughout the proceeding, and neither the Sto:lo Nation nor either of the two tribal organizations (consisting of 21 Bands) of which it is comprised have moved to participate in the proceeding. The Sto:lo Nation states that it did not intervene sooner because neither of its tribal organizations kept close tabs on the developments in the Ross Lake area. However, to allow intervention at this advanced stage of the proceeding would delay and disrupt the proceeding. In any event, to the extent the Sto:lo Nation is concerned with the preservation of traditional cultural resources in the project vicinity, the license issued by this order requires studies to inventory traditional cultural properties as well as analysis of any impact of continued project operation on those traditional cultural properties and implementation of methods to mitigate any such impact. For the above reasons, we will deny the Sto:lo Nation's late motion to intervene.

III. DESCRIPTION OF THE SETTLEMENT AGREEMENT

The Settlement Agreement consists of the following documents, with supporting plans and reports. The parties that

12/ The record does not indicate whether the Sto:lo Nation served copies of this motion to intervene on each person on the official service list.

have joined in each agreement with Seattle are listed following the title of the pertinent agreement.

(1) Offer of Settlement:
the Park Service, FWS, the U.S. Bureau of Indian Affairs, the Forest Service, NMFS, the Tribes, the Nlaka'pamux Nation, Washington Game, the Conservation Council, and Washington Fisheries.

(2) Fisheries Settlement Agreement:
the Park Service, FWS, the Bureau of Indian Affairs, the Forest Service, NMFS, the Tribes; Washington Fisheries, Washington Department of Wildlife (Washington Wildlife); and the Conservation Council.

(3) Settlement Agreement on Recreation and Aesthetics:
the Park Service, the Forest Service, the Tribes, and the Conservation Council.

(4) Settlement Agreement Concerning Erosion Control:
the Park Service.

(5) Settlement Agreement Concerning Wildlife:
Washington Wildlife, the Park Service, the Bureau of Indian Affairs, FWS, the Forest Service, the Tribes, and the Conservation Council.

(6) Settlement Agreement Concerning Cultural Resources (Archaeological and Historic Resources):
the Park Service and the Tribes.

(7) Settlement Agreement Concerning Cultural Resources (Archaeological Resources):
the Nlaka'pamux Nation.

(8) Settlement Agreement Concerning Traditional Cultural Properties:
the Upper Skagit Tribe.

(9) Settlement Agreement Concerning Traditional Cultural Properties:
the Sauk-Suiattle Tribe.

(10) Settlement Agreement Concerning Traditional Cultural Properties:
the Swinomish Indian Tribal Community.

(11) Settlement Agreement Concerning Traditional Cultural Properties:
the Nlaka'pamux Nation.

Because no new hydropower facilities will be constructed, the measures in the agreement deal with operational considerations (e.g., fill and flow plans), operational impacts (e.g., erosion protection), enhancement (e.g., recreational facilities), and support for cultural practices.

A. Fisheries

The Fisheries Settlement Agreement incorporates the Anadromous Fish Flow Plan and the Anadromous and Resident Fish Non-Flow Plan and establishes Seattle's obligations relating to fishery resources affected by the project, including numerous provisions to protect resident and migratory fish species. These provisions include, but are not limited to, a filling schedule for Ross Lake reservoir, flows downstream of Gorge powerhouse, flow releases and limits to protect salmon and steelhead spawning and development, requirements for dry water years, advance scheduling of hourly generation, field monitoring, and nonflow measures for steelhead production, chinook salmon research, chum salmon habitat, sediment reduction, and trout protection and production.

The Anadromous Fish Flow Plan is intended to mitigate the impacts of daily and seasonal downstream fluctuations. However, even with the complete implementation of the Anadromous Fish Flow Plan, some level of these impacts would continue to occur. Fish will still be exposed to daily and seasonal flow fluctuations, which will result in the continuation of chronic fry stranding at a reduced, unknown level. In addition, the configuration and operation of the project has rendered some formerly productive fish habitat inaccessible. The Anadromous and Resident Non-flow Plan is specifically intended to address these residual impacts and habitat losses. Seattle's expenditures to accomplish the nonflow plan total $6,320,000 over the term of the license.

B. Recreation and Aesthetics

The Settlement Agreement Concerning Recreation and Aesthetics incorporates the Skagit Project Recreation Plan and the Skagit Project Visual Quality Mitigation Plan, and establishes Seattle's obligations relating to recreation and the visual quality of project facilities as currently constructed.

Under the Recreation Agreement, Seattle will continue to provide recreation opportunities such as tours, contributions, and services; replace or modify boat ramps, docks, and access sites; improve the Newhalem visitor contact station; upgrade a picnic site; provide funding for a number of purposes (including a water distribution system); provide an environmental learning center, overlook sites, handicapped access, recreational trails, boat access, picnic sites, park facilities, and recreation needs assessments; promote coordination of participants; and provide

operation and maintenance costs at Forest Service and Park Service facilities in the area. The evaluation area for the Recreation Plan covered an area well beyond the current project boundary, and includes the drainage of the Skagit upstream of Rockport; the tributary Cascade, Suiattle, and lower Sauk River drainages; the North Cascades National Scenic Highway area; and a narrow corridor along the lower Skagit River from Rockport to Burlington. Proposed licensee expenditures to accomplish these goals would total approximately $17,000,000 over the term of the license.

Under the Skagit Project Visual Quality Mitigation Plan, Seattle will take various actions, including maintenance of water levels in Ross Lake reservoir, painting, modifying or removing certain project structures, changing outdoor lighting systems, and consulting with the Park Service before undertaking certain construction or maintenance activities. To improve the visual quality of the Diablo and Newhalem townsites, Seattle will screen certain views, revegetate portions of the shoreline area around Gorge Lake reservoir and set them aside for public use, enhance existing planting islands, remove or relocate buildings, develop a new project greenhouse, improve parking areas, and develop an overlook and information center across from the Gorge powerhouse. To manage visual resources in and around transmission-line rights-of-way, Seattle will implement prescriptions to manage them, including specific measures for problem areas that have been identified. Seattle's expenditures to accomplish these goals total approximately $7,500,000 over the term of the license.

C. Erosion Control

The Settlement Agreement Concerning Erosion Control incorporates the Erosion Control Plan. Thirty-seven sites along the reservoir shoreline and eighteen road sites have been identified in the Settlement Agreement for priority erosion control measures. These measures include (1) active erosion control measures on shorelines (placement of control structures and vegetation to halt or greatly reduce erosion) to maintain the natural and wilderness conditions of the Skagit River Project area; and (2) passive measures (monitoring to obtain additional information on the processes and rates of erosion). Under the Erosion Agreement, the Park Service will have the lead role and will be responsible for all aspects of erosion control work, except at Project road sites.

In addition, other erosion control work will be performed at sites identified during the license period. Seattle will also fund and implement construction of greenhouse facilities and institution of a plant propagation program to supply stock for erosion control sites. Seattle's expenditures to accomplish these goals total $1,345,000 over the license period.

D. Wildlife

Seattle filed a Settlement Agreement Concerning Wildlife (Wildlife Agreement) and a Wildlife Habitat Protection and Management Plan (Wildlife Plan) with the Offer of Settlement. The documents contemplated, among other things, that Seattle acquire lands located outside the Recreation Area in the downstream Skagit River area and near the South Fork of the Nooksack River for wildlife habitat protection and enhancement; 13/ provide financial support for monitoring and information-gathering to be performed by the Park Service and the Forest Service; provide a research facility at the project and correlative research and monitoring programs; establish a Wildlife Research Advisory Committee; establish a Wildlife Management Review Committee; and provide annual contributions to the North Cascades Environmental Learning Center.

Seattle's expenditures under this agreement total $19,940,000, including up to $17,000,000 for land acquisition and habitat manipulation and enhancement; $20,000 for cultural resource reconnaissance surveys on any land to be disturbed by wildlife habitat manipulations; $2,920,000 for research, including a research building and equipment ($130,000); research study funding ($1,500,000 total in annual payments); long-term environmental monitoring by the Park Service in Recreation Area ($600,000); bald eagle inventory and planning by the Forest Service ($90,000); and $600,000 for education (as annual payments of $20,000 to the North Cascades Environmental Learning Center).

E. Cultural Resources and Traditional Cultural Resources

1. Cultural Resources -- Archaeological and Historic

Seattle submitted a Settlement Agreement Concerning Cultural Resources -- Archaeological and Historic Resources, 14/ followed by a Settlement Agreement Concerning Cultural Resources -- Archaeological Resources 15/ (jointly referred to as the Cultural Resources Agreement). The Cultural Resources Agreement addresses the cultural resources affected by the Skagit River Project and provides that the licensee make available an

13/ The Settlement Agreement states that it is necessary to restore habitat for elk that has been and continues to be depleted by the logging industry.

14/ This document represents the agreement reached between Seattle, the Park Service, and the Tribes.

15/ This agreement serves to establish the Nlaka'pamux Nation's concurrence with the Cultural Resources Agreement and join the Nlaka'pamux Nation as a party.

estimated total amount of $1,817,000 for the purpose of funding the measures and programs. Of that amount, $352,000 is for historic resources, and an estimated $1,465,000 is for archaeological resources.

Under the Cultural Resources Agreement, Seattle will fund field testing and evaluation of those archaeological sites which have the potential for being found eligible for listing on the National Register of Historic Places. Seattle will provide a total estimated amount of $1,465,000 to implement these measures and any mitigation and management programs required as a result of the information collected during field testing and evaluation. The Cultural Resources Agreement also provides that Seattle make available $352,000 for the purpose of interpreting and documenting historic building and engineering resources and providing protection, maintenance, and mitigation related to those historic resources.

2. Traditional Cultural Resources

Seattle entered into individual Settlement Agreements Concerning Traditional Cultural Properties with the Upper Skagit Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Tribe, and the Nlaka'pamux Nation. These Agreements provide for the completion of studies needed to inventory certain traditional cultural properties and to analyze the potential impacts of continued project operation on those traditional cultural properties. The agreements between Seattle and the Tribes provide for funding in the amount of $1,316,669 for each group. The agreement between Seattle and the Nlaka'pamux Nation provides for funding in the total amount of $600,000.

3. Summary

Memoranda of Agreement were entered into by the licensee, the Washington State Historic Preservation Officer, the Advisory Council on Historic Preservation, the Park Service, the Tribes, the Nlaka'pamux Nation, and Commission staff. These agreements call for the fulfillment of earlier memoranda of agreement between the parties regarding historic and archaeological resources (the provisions of which are incorporated into the Cultural Resources Agreement), as well as the provisions of the Cultural Resources Agreement and the Traditional Cultural Properties Agreements.

IV. ENVIRONMENTAL ANALYSIS

The environmental analysis of Seattle's proposal concentrated on various resources, including fisheries, vegetation and wildlife, visual resources, cultural resources, and land use and recreation. Because these resources are

frequently affected by slope stability, geology and soils were also considered.

Implementation or continuation by Seattle of the Settlement Agreement provisions will produce the following effects. Flow releases from the project will continue to be managed to improve conditions for salmon and steelhead spawning, redds, 16/ and fry 17/ in the river. Additional nonflow measures will be implemented for enhanced steelhead production, chinook salmon research, fish habitat development, sediment reduction, and trout protection and production. A short reach of the river below Gorge dam will continue to be dewatered, and the slight detriment to resident and anadromous fish will persist. The reservoirs will continue to occupy what was formerly terrestrial wildlife habitat. Wildlife habitat in the basin will be improved and enhanced through habitat acquisition and improvement. Recreational facilities associated with the project will be improved, including erosion control measures. Visual quality will be enhanced through repair of facilities, screening, and revegetation. Archaeologic and historic resources will be protected through refurbishment of facilities, education, interpretation, and information-gathering. Traditional cultural properties will be inventoried, protected, and enhanced.

Based on the environmental analysis conducted in this proceeding, the Commission concludes that issuance of a new license for the Skagit River Project, with the inclusion of the recommended environmental enhancements discussed below, will not constitute a major federal action significantly affecting the quality of the human environment.

V. DISCUSSION

The Settlement Agreement filed by the parties contains the resolution of a wide range of complex and conflicting areas of interest to the various parties, and is the product of several years of negotiations among these parties. We encourage settlements in proceedings before us, and we commend the parties to the Settlement for investing the time and effort required to reach this comprehensive agreement.

16/ Redds are defined as the gravel nests in which salmon and steelhead lay their eggs.

17/ Fry are juvenile fish that have emerged from the gravel nests and are ready to feed.

The Commission may approve all or part of the provisions of an uncontested settlement 18/ upon a finding that the agreement is fair, reasonable, and in the public interest. 19/ The Commission may prescribe license requirements to ensure its ability to monitor and, if necessary, enforce the licensee's compliance with the provisions included as license requirements. After review of the proffered Settlement Agreement and the record in this proceeding, we have determined that we will accept the Agreement as in the public interest and will include in a new license for Project No. 553 the provisions which are appropriate for adoption as license conditions.

The Settlement Agreement includes certain provisions that require action by parties other than the licensee or deal with matters which are beyond the Commission's role to enforce, such as procedures for consultation or dispute resolution among the parties and the procedures to be followed by committees (comprised of various parties to the agreement) which will review implementation of the agreement and direct minor changes in the prescribed measures and activities. Under certain other provisions, Seattle will perform various enhancement measures that are far removed from and unrelated to the project and that are more appropriately monitored and enforced by local entities or other federal agencies. We understand that these far-ranging agreements are essential elements of this very complex and delicate settlement. We congratulate the parties for their creativity in addressing a wide range of issues not normally addressed in a relicensing case and for their success in forming a consensus on these issues. We will support the settlement, but the parties certainly recognize that certain aspects of it are

18/ Initially, the Nlaka'pamux Nation filed objections to the Offer of Settlement; however, the issues raised in that filing have been resolved as reflected in the Settlement Agreement Concerning Cultural Resources: Archaeological Resources, and the Settlement Agreement Concerning Traditional Cultural Properties of the Nlaka'pamux Nation. The Settlement Agreement was not contested by any other party.

19/ 18 C.F.R. 385.602(g)(3). See also Public Utility District No. 2 of Grant County, Washington, et al., 45 FERC 61,401 (1988); Consumers Power Company, 68 FERC 61,077 (1994).

simply beyond the Commission's jurisdiction to enforce. Those types of provisions are not incorporated into the license. 20/

The license will include all the provisions in the Anadromous Fish Flow Plan (Flow Plan) and the Anadromous and Resident Fish Non-Flow Plan (Non-Flow Plan) included in the Fisheries Agreement, which relate to the fishery resources affected by the project. As stated above, these include, but are not limited to, the Fisheries Agreement's requirements regarding the minimum flow requirements, downramping rates and times, adjustments to flows during spawning periods, and various monitoring measures. The provisions of the Flow Plan will mitigate the impacts of daily and seasonal downstream flow fluctuations. The provisions of the Non-Flow Plan speak to the residual impacts of chronic fry stranding due to daily flow changes and loss or inaccessibility of habitat resulting from the configuration of the project.

The license will include all the provisions of the Erosion Control Agreement. The EA determined that shoreline and road erosion are conditions which will continue to deteriorate unless addressed, and that the Erosion Agreement considers shoreline sites where erosion control would be of most value.

The license will include all the terms of the Cultural Resources Agreement, which provides for the protection, maintenance, and mitigation of archaeological and historic resources. The EA determined that the potential for undiscovered prehistoric sites in the project area is high. Archaeological sites have been identified through an inventory-level survey in the draw-down zone at Ross Lake and in nearby forested areas. Also, certain properties at the project have been identified as eligible for listing in the National Register of Historic Places.

The license will include all the terms of the Traditional Cultural Properties Agreements. Several areas of concern relating to project operation which have a bearing on traditional cultural values were identified during the environmental analysis process. These include continued lack of access to archaeological sites with traditional cultural value and significance due to flooding of areas to create reservoirs; continued impact on downstream traditional economic activity sites (such as fishing locations) and the continued need to

20/ The licensee may proceed under these settlement provisions as private agreements among the parties (that may be enforced through private remedies independent of the Commission) insofar as they do not conflict with the license articles or interfere with the exercise of the Commission's statutory authority. See, e.g., Consumers Power Company, 68 FERC 61,077 (1994) at pp. 61,372, 61,374.

maintain the fishery; and development of recreation which would have an impact on traditional cultural values and properties.

The mitigative measures are appropriate in light of the potential effects of project operation on traditional cultural properties. The determinations made in the EA regarding the effect of relicensing this project on traditional cultural properties lead to the conclusion that the provisions of the Cultural Properties Agreements provide appropriate mitigation measures, but that certain effects on traditional cultural properties (such as lack of access to archaeological sites and historic information below reservoir draw-down zones) will continue despite these mitigative measures. Therefore, funding by Seattle of traditional cultural activities is appropriate in this instance, since measures to provide equivalent mitigation of this type of effect on traditional cultural properties are not possible with continued operation of the project.

The license will include the provisions in the Wildlife Agreement relating to support for the wildlife research program. The program will provide support for research on wildlife resources (including the impact or effect of the project on wildlife) and facilitate the development of information and methods that will lead to better understanding and management of the wildlife and ecosystems in these areas. Under the new license, Seattle will also provide financial support, through annual contributions, for the educational program at the North Cascades Environmental Learning Center established in the Recreation and Aesthetics Agreement.

The license will not, however, include the Agreement's provisions for elk habitat, to be selected by a Wildlife Land Acquisition Group and acquired by the licensee. The EA concluded that relicensing the project will not affect elk. Moreover, according to the Wildlife Agreement, the elk habitat will not be located within the Recreation Area (the reservation within which the project is located). 21/ In fact, these habitat may well be located within one or more different federal reservations. Also, the license will not include the provisions under which the licensee has agreed to fund the Park Service's long-term environmental monitoring within the North Cascades National Park Complex (encompassing the National Recreation Area, the North Cascades National Park, and the Lake Chelan Recreation Area), since most of the monitoring will involve lands far beyond the project boundary and in other reservations. Similarly, the license will not include the provisions under which the licensee has agreed to fund the Forest Service's inventory and planning of bald eagle and other wildlife habitat, since these activities

21/ As proposed in the Wildlife Agreement, the elk habitat would be located some 15 to 20 miles from the project.

will occur from 10 to 48 miles downstream of the project, in the Skagit National Recreation River Corridor and the Sauk, Suiattle, and Cascade National Scenic River Corridors. As noted, the Commission has no objection to any of these measures, and the parties are free to carry out these provisions of their agreement.

The license will include those measures in the Recreation and Aesthetics Agreement which will improve the visual quality of project facilities and provide additional recreational opportunities within or reasonably close to the project boundary. These measures take into account the needs of boaters, hikers, fishermen, picnickers, and tourists who seek to enjoy the natural resources of the area. The license will not include six recreation sites that are between 22 and 45 miles from the project boundary and that are located in reservations other than the one the project occupies.

VI. WATER QUALITY CERTIFICATION

Under Section 401(a)(1) of the Clean Water Act, 33 U.S.C. 1341(a)(1), the Commission may not issue a license for a hydroelectric project unless the state certifying agency has either issued water quality certification for the project or waived certification for the project by failing to act on a request for certification within a reasonable period of time, not to exceed one year.

By letter dated April 8, 1977, the Washington Department of Ecology (Department of Ecology) noted that the Skagit River Project caused no adverse downstream water quality effects and that water quality was high. By letter to the Department of Ecology dated June 29, 1977, Seattle requested water quality certification for the project. Because the Department of Ecology did not act on the request within one year, the certification is deemed waived. 22/

VII. COASTAL ZONE MANAGEMENT ACT

Under Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program. Because the Skagit River Project is located in a coastal zone and may affect coastal resources, the Department of Ecology must review the proposed project for consistency with the state's Coastal Management Program. Under the CZMA, before a license can

22/ By letter dated December 13, 1991, the Department of Ecology acknowledged that it had waived certification.

be issued, the Department of Ecology must either (1) find the project consistent with the CZMA program, or (2) waive the requirements by failing to act in a timely manner (i.e., within 180 days of receiving the applicant's certification).

By letter dated January 7, 1994, the Commission asked Seattle to consult with the Department of Ecology and supply the Department of Ecology and the Commission with a certification of consistency with the Coastal Management Program. The Department of Ecology responded to Seattle with a concurrence letter dated February 15, 1994. Seattle responded to the Commission by letter dated February 23, 1994. 23/

VIII. THREATENED AND ENDANGERED SPECIES

The EA noted that the Skagit River Project is located in an area inhabited by peregrine falcon (endangered species), northern spotted owl (threatened species), bald eagle (threatened species), marbled murrelet (threatened species), grizzly bear (threatened species), and gray wolf (endangered species). The EA evaluated whether these species would be affected by the proposed relicensing of the project. No specific case has been identified where the project is causing problems for any listed species, and continued operation of the project will not likely cause any new or direct impact on listed species or their habitats.

The Commission staff prepared a biological assessment pursuant to the Endangered Species Act in which it concluded that the project is unlikely to adversely affect listed species. The biological assessment was submitted to FWS on May 31, 1994. By letter dated August 10, 1994, FWS concurred with its conclusion. FWS recommended that Seattle place identifiers, such as aviation spheres, to prevent eagle collisions with the powerlines at each location where the lines cross the Skagit River. The biological assessment indicated that bald eagles were not known to have collided with the powerlines. However, marking the transmission line sections that cross the Skagit River is justified by bald eagle use of the river as a flight path and involves negligible costs. Therefore, Article 411 requires Seattle to install

23/ Coastal resources that may be affected by hydroelectric development in Washington include anadromous fish, water quality, and sediment. The expected impacts of relicensing are quantified in the EA. Because the current operation of the Skagit River Project will not change, no new impacts will occur. Continued flow fluctuations from project operations would have a minor effect on anadromous fish. Based on the EA, we conclude that the Skagit River Project will not have a significant impact on coastal resources.

aviation markers on the section of the project transmission line that crosses the river.

IX. WILD AND SCENIC RIVERS

In 1978, Section 703 of P.L. 95-625 24/ designated selected segments of the Skagit, Cascade, Sauk, and Suiattle Rivers for inclusion in the national Wild and Scenic Rivers System. Below the Gorge Powerhouse, the Skagit River runs free of impoundments and is protected under the Wild and Scenic Rivers Act from the Recreation Area boundary at Bacon Creek (river mile 82.9) to Sedro Woolley (river mile 24.4). Also protected are the three main tributaries to the Skagit, the Cascade, Sauk, and Suiattle Rivers, which enter the Skagit downstream from the project impoundments. 25/ As noted, the Skagit River Project is located between river miles 127 and 94 of the Skagit River. Existing project transmission lines and towers are visible along the Skagit River.

Visual conditions are of particular concern in the Wild and Scenic River segments. 26/ However, the EA concluded that, if the licensee is required to revegetate along the rights-of-way and repaint powerline towers, relicensing of the Skagit River Project will not affect the wild and scenic river segments. The license so requires.

X. FISH PASSAGE

Section 18 of the FPA, 16 U.S.C. 811, states that the Commission shall require construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of Commerce or of the Interior. As parties to the

24/ 92 Stat. 3522 (Nov. 10, 1978).

25/ See Report on Aesthetics: Visual Quality Mitigation Analysis at 1.1.

26/ Section 7(a) of the Wild and Scenic Rivers Act, 16 U.S.C. 1278, prohibits the Commission from licensing "the construction of" any project works that would be "on or directly affecting" a reach of river included in the Wild and Scenic Rivers System, or licensing "the construction of" any water resource project that would have "a direct and adverse effect on the values for which such river was established . . . ." The Skagit River Project predates the wild and scenic designation in question, and the new license authorizes no new construction affecting the designated reach. Therefore, the Act does not bar the relicensing of the project. Cf. Northern States Power Co., 67 FERC 61,282 (1994) at p. 61,959.

Settlement Agreement, both Interior (FWS) and Commerce (NMFS) agreed (along with other parties to the Settlement Agreement) "that all issues concerning environmental impacts from relicensing of the Project, as currently constructed, are satisfactorily resolved by these Agreements." 27/ Neither agency prescribed a fishway or requested a reservation of fishway prescription authority. Standard license Article 15 reserves the Commission's authority to require fish passage in the future, should circumstances warrant. 28/

XI. SECTION 4(e) OF THE FEDERAL POWER ACT

Section 4(e) of the FPA, 16 U.S.C. 797(e), requires that Commission licenses for projects located within United States reservations must include all conditions that the Secretary of the department under whose supervision the reservation falls shall deem necessary for the adequate protection and utilization of such reservation. As noted, the Skagit River Project is within the Recreation Area. 29/ The Park Service, which administers the Recreation Area, is a party to the Settlement Agreement, which provides that "all issues concerning environmental impacts from relicensing of the Project, as currently constructed, are satisfactorily resolved by these Agreements." 30/

27/ Offer of Settlement at 5.

28/ See Form L-5, Terms and Conditions for Constructed Major Project Affecting Navigable Waters and Lands of the of the United States, 17 FPC 1832 (1975), incorporated by reference in the new license for Project No. 553. See Ordering paragraph (D), infra. Standard license Article 15 provides that the Commission, either upon its own motion or upon recommendation by Interior or state fish and wildlife agencies, and after notice and opportunity for hearing, may order the licensee to install facilities to benefit the fish resources.

29/ As lands acquired and retained by the United States to carry out the public purposes of the Recreation Area, these lands constitute a "reservation" within the meaning of Section 3(2) of the FPA. See generally City of Redding, California, 63 FERC 61,175 (1993).

30/ Offer of Settlement at 5. We note that, while the parties may stipulate that the Settlement Agreement satisfies their concerns regarding the project, and while the Commission is accepting the Agreement, the new license remains subject to articles reserving the Commission's authority, after notice and opportunity for hearing, to

(continued...)

The general provisions included in each of the Settlement Agreements state that the signatories submit the Agreements to the Commission "as their recommendations relating to said resource under any applicable provisions of the FPA (including without limitation Sections 10(a), 10(j), and 4(e) thereof.)" The Park Service did not submit any additional comments on the proposed project or conditions for inclusion in the license.

XII. SECTION 10 OF THE FEDERAL POWER ACT

Section 15(a)(2) of the FPA provides that the requirements of Section 10 of the FPA, 16 U.S.C. 803, pertaining to conditions of licenses, are applicable also to Commission consideration of new license applications.

A. Comprehensive Plans

Section 10(a)(2)(A) of the FPA, 16 U.S.C 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with the federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. 31/ Under Section 10(a)(2)(A), federal and state agencies filed a total of 65 comprehensive plans for Washington. Of these, the staff determined that 14 of

30/(...continued)
address resource issues if future circumstances warrant. See Puget Sound Power & Light Co., 41 FERC 61,255 (1987) at p. 61,665; Public Utility District No. 1 of Douglas County, Washington, 54 FERC 61,208 (1991) at p. 61,210.

31/ Comprehensive plans for this purpose are defined at 18 C.F.R. 2.19 (1994).

these plans are relevant to this project. 32/ No conflicts were found.

B. Recommendations of Other Agencies

Section 10(a)(2)(B) of the FPA, 16 U.S.C. 803(a)(2)(B), requires the Commission to consider the recommendations of relevant federal and state agencies exercising administration over flood control, navigation, irrigation, recreation, cultural and other relevant resources, as well as the recommendations of Indian tribes affected by the project. As noted, the Settlement Agreement constitutes the recommendations of the agencies and tribes, and the pertinent fish and wildlife terms of the Agreement are reflected in the articles of the license we issue today.

32/(1) Statute establishing the State Scenic River System, 1977, State of Washington;
(2) Pacific Fishery Management Council, 1978, National Marine Fisheries Service;
(3) Statewide Comprehensive Outdoor Recreation Plan, 1985, Washington Interagency Committee for Outdoor Recreation;
(4) 1987 Strategies For Wildlife, 1986, Washington Department of Game;
(5) Hydroelectric Project Assessment Guidelines, 1987, Washington State Department of Fisheries;
(6) Natural Heritage Plan, 1987, Washington State Department of Natural Resources;
(7) Woodlands Priority Plan, 1987, Washington Interagency Committee for Outdoor Recreation;
(8) General Management Plan: North Cascades National Park, Ross Lake National Recreation Area and Lake Chelan National Recreation Area, 1988, National Park Service;
(9) Scenic Rivers Program report, 1988, Washington State Parks and Recreation Commission;
(10) Mount Baker-Snoqualmie National Forest Land and Resource Management Plan, 1990, Forest Service;
(11) Washington Outdoors: Assessment and Policy Plan 1990-1995, 1990, Washington Interagency Committee for Outdoor Recreation;
(12) State Trails Plan: Policy and Action Document, 1991, Washington Interagency Committee for Outdoor Recreation;
(13) Northwest Conservation and Electric Power Plan, 1991, Northwest Power Planning Council; and
(14) Hydropower Development/resource Protection Plan, 1992, Washington State Energy Office.

C. Consumption Efficiency Improvement Programs

Section 10(a)(2)(C) of the FPA, 16 U.S.C. 803(a)(2)(C), requires that the Commission, in acting on a license application such as this, to consider the electricity consumption efficiency improvement program of the applicant, including its plans, performance, and capabilities for encouraging or assisting its customers to conserve electricity cost-effectively, taking into account the published policies, restrictions, and requirements of state regulatory authorities. In the State of Washington, the Washington Utilities and Transportation Commission has statutory and regulatory authority regarding least-cost planning and energy conservation.

Seattle's plans and activities to promote and achieve conservation of electric energy and to reduce the peak demand for generating capacity include (1) energy-efficient street lighting replacements, (2) water heater wraps, (3) an efficiency evaluation and upgrade of the distribution system, (4) residential customers free energy audits, and (5) bill-stuffing information to customers. The Washington Utilities and Transportation Commission, the State's regulatory commission, has no specific statute regarding conservation planning in Washington.

The Skagit River Project complies with the development plans and programs of the Pacific Northwest Electric Power and Conservation Planning Council and its Regional Energy Plan.

D. Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the FPA, 16 U.S.C. 803(j), requires the Commission to include license conditions based on recommendations of federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq., for the protection, mitigation, and enhancement of fish and wildlife resources. The EA and this order address these concerns. This license includes appropriate conditions consistent with the recommendations of the agencies, as incorporated in the Settlement Agreement.

XIII. SECTION 15 OF THE FEDERAL POWER ACT

Section 15 of the FPA, 16 U.S.C. 808, specifies a number of factors that the Commission is required to evaluate and consider in acting on an application for a new license following the expiration of an existing license. These factors include (1) compliance history and ability to comply with the requirements imposed in the new license; (2) safe management, operation, and maintenance of the project; (3) ability to provide efficient and reliable electric service; (4) need for power;

(5) transmission services; (6) project modifications; (7) cost effectiveness of plans; and (8) actions affecting the public.

A. Compliance History and Ability to Comply with a New License

The Federal Power Commission issued the license for the Skagit River Project in 1928. We have reviewed Seattle's compliance with the terms and conditions of the existing license. Seattle has a satisfactory record of filing submittals in a timely fashion and of complying with its existing license. Therefore, and in consideration of the requirements of the new license, we conclude that Seattle has or can acquire the resources and expertise to carry out its plans and comply with all articles, terms and conditions of the new license and other provisions of Part I of the FPA.

B. Safe Management, Operation, and Maintenance

Seattle has continuously operated the plant in a safe way. Because of this safe operation, there are no plans to change the present operating plan.

Seattle has developed an emergency action plan to warn the public in the event that a problem is detected at one of the dams. It has installed safety barriers and warning signs at all three of the developments to warn boaters not to proceed any closer to the dams. Prior to initiating large spills at Gorge dam the operators patrol the downstream river area to warn the public about impending changes in operation.

Based upon our review of the specific information provided by Seattle on various aspects of the Skagit River Project that affect public safety, inspection reports by the Commission's Regional Director, and independent consultant reports filed under Part 12 of our regulations 33/, we conclude that Seattle's plans to manage, operate and maintain the Skagit River Project are adequate. 34/

33/ 18 C.F.R. Part 12 (1994).

34/ Analysis of related issues is provided in the Safety and Design Assessment.

C. Efficient and Reliable Electric Service

The Commission's staff examined Seattle's operation of the Skagit River Project and found that Seattle has operated the project in an efficient and reliable manner. The staff found that lost generation because of unscheduled outages is not significant compared to the annual generation for the Skagit River Project. Seattle coordinates the operation of the Ross, Diablo, and Gorge developments to efficiently develop the hydroelectric potential of the Skagit River. In light of the above, and our review of staff operation inspection reports and Seattle's past performance and future plans to operate the project, we believe that the project is, and under the new license will continue to be, operated and maintained in an efficient and reliable manner.

D. Need for Power

Seattle's need for the electricity produced by the Skagit River Project is addressed in the EA. The project is located in the Northwest Power Pool area of the Western Systems Coordinating Council and in the Northwest Power Planning Council's (NPPC) planning region.

Seattle is a municipal corporation organized and operating under the laws of the State of Washington. Seattle's system supplies public utility services to city residents. Seattle has over 300,000 customers with an average annual energy requirement of about 9,600 gigawatthours (GWh). The project produces annually an average of 3,946 GWh under current operating conditions, somewhat less than half of the total demand. Seattle serves about 75 percent of its load with owned and contracted resources, and relies on purchases from Bonneville Power Administration (BPA) to meet its remaining load.

Seattle intends to continue using power generated from the project to serve its growing load requirements and displace other, higher cost resources. Seattle's current medium base electric load growth forecast indicates it will continue to need firm energy resources, such as that provided by the Skagit River Project. Thus, it is clear that the project has been providing and can continue to provide a substantial amount of Seattle's electric energy requirements.

E. Transmission Services

Seattle proposes no changes in the transmission network affected by the Skagit River Project operation. Therefore, we find that the existing transmission system is sufficient.

F. Cost-Effectiveness of Plans

No additional generating capacity is proposed at the Skagit River Project. The Settlement Agreement, as approved herein, provides for certain modifications to project operation in order to enhance fisheries resources. Taking into account these modifications, the project will fully develop and use the economical hydropower potential of the site.

G. Actions Affecting the Public

The Skagit River Project plays an important role in the local economy and quality of life sought by the area residents and visitors. Seattle pays annual taxes to the Province of British Columbia and contributes payments in lieu of taxes to the jurisdictions in the State of Washington neighboring the Skagit River Project. The project also provides employment opportunities and attracts tourists who patronize local businesses.

XIV. COMPREHENSIVE DEVELOPMENT

Pursuant to Section 10(a)(1) of the FPA, any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

A. Recommended Alternative

The EA analyzes the effects of the Skagit River Project as proposed in the Settlement Agreement, as well as the effects of the Settlement Agreement with minor additions and refinements considered by the staff, and the effects of denying the relicense application. The Commission has selected as the preferred alternative the issuance of a new license consistent with the terms of the Settlement Agreement. We have selected this option because (1) the environmental effects of continuing to operate the hydroelectric facility will be minor; (2) the recommended mitigation and enhancement measures will benefit fisheries, wildlife, cultural resources, and recreation and aesthetics; (3) the licensee is required to ensure the continued monitoring of environmental needs in the project area; and (4) 2,655 GWh of energy will continue to be generated annually from a renewable energy resource that creates no atmospheric pollutants.

In our view, continued operation of the project consistent with the terms of the Settlement Agreement will allow Seattle to continue to provide its citizens with a reasonably priced source of power from a renewable energy resource while also providing substantial benefits for nondevelopmental resources. For this

reason, we find the Settlement Agreement fair, equitable, and in the public interest. We further find that the project, if operated under a license with the terms included herein, will be best adapted to a comprehensive plan for the Skagit River Basin.

XV. LICENSE TERM

Section 15 of the FPA specifies that a new license shall be for a term that the Commission determines to be in the public interest, but not less than 30 years or more than 50 years. The Offer of Settlement states that various provisions contained in the individual Settlement Agreements were negotiated based upon a license term of 30 years. 35/ In comments to the draft EA, the Department of the Interior, the North Cascades Institute, Seattle, and the Conservation Council each urged the Commission to designate a license term of 30 years, consistent with the Settlement Agreement. It appears that all interested parties to the proceeding favor a 30-year term for Seattle's new license. Therefore, in this particular instance, we will issue the license for a 30-year term.

XVI. SUMMARY

In light of all of the above, including our review of the environmental analysis of the proposed project and its alternatives conducted by our staff, we conclude that issuing a new license for the Skagit River Project with the requirements included herein will not conflict with any planned or authorized development and will best adapt the project to a comprehensive plan for developing the Skagit River for beneficial public purposes.

The Commission orders:

(A) This license is issued to Seattle City Light Company (Licensee) for a period of 30 years, effective the first day of the month in which this license is issued, to operate and maintain the Skagit River Project. This license is subject to the terms and conditions of the FPA, which is incorporated by reference as a part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

35/ Under the Agreement, a license term of longer duration would give rise to a right of the parties to initiate a proceeding before the Commission between the 25th and 30th year of the license to reopen the provisions which were specifically based upon a 30-year license term.

(B)(1) The following parts of exhibit M and the following exhibit J, K, and L drawings conform to the Commission's rules and regulations and are approved and made a part of the license:

Exhibit M: page 1 through 4, and table M-1 with the exceptions noted in footnote number. 36/

Table 1. Exhibit J and Drawings

Exhibits	FERC No. 553	Showing
J-101	217	General Project Map
J-102	218	General Project Map
K T-12a through T-46a	219 through 257	Transmission R/W Bothell Sub to Newhalem
K-101 through 109	258 through 266	Project Area Newhalem to Canadian Border

36/ The Commission in a March 6, 1956 order approved an Exhibit M which showed the installed capacity of units 21 and 22 was 27 megawatts (MW). On December 8, 1992, the Commission authorized the rewinding of Unit No. 24 at the Gorge High Dam Development, increasing the installed capacity from 60 MW to 97 MW. Article 304 requires the licensee to file a revised Exhibit M.

Table 2. Approved exhibit L drawings

Sheet number	FERC No. 553-	Title
L - 101	267	Gorge Power Facilities, Plan & Sections
L - 102	268	Gorge Dam Plan, Elevation & Sections
L - 107	273	Gorge Powerhouse Plan & Sections
L - 111	277	Diablo Power Facilities Plan & Sections
L - 112	278	Diablo Dam Plan, Elevation & Sections
L - 116	282	Diablo Powerhouse Plan & Sections
L - 120	286	Ross Power Facilities Plan & Section
L - 121	287	Ross Dam Plan, Elevation & Sections
L - 130	296	Ross Powerhouse Plan & Sections

(B)(2) The primary transmission line segments and related electrical facilities extend from the project generators, through appropriate voltage transformation, to a point of interconnection with the Bonneville Power Administration's (BPA) transmission system at the North Mountain Substation (NM), and to the applicant's system at the Bothell Substation (Sub).

The primary line segments include: the generator leads; two, 3-phase, delta-wye, step-up transformer banks each rated 210-Megavoltamperes (MVA) and 66.75-MVA at Ross and Diablo powerhouses respectively, and 93-MVA and 75-MVA at the Gorge powerhouse; the six, overhead, 230-kilovolt (kV) transmission lines listed below; and, appurtenant facilities.

Circuit Name	Line Segment	Circuit Miles
Ross #1	Ross-Diablo	3.80
Ross #2	Ross-Diablo	3.85
Diablo #1	Diablo-Sub	87.20
Diablo #2	Diablo-Sub	87.20
Diablo #3	Diablo-Sub	87.20
Go-NM	Gorge-North Mt.	39.00

(B)(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibits J, K, M, and L described above are approved and made part of the license.

(D) This license is subject to the articles set forth in Form L-5, (October 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States and Lands of the United States", and the following additional articles:

Article 201. The Licensee shall pay the United States an annual charge, effective the first day of the month in which this license is issued for the purpose of:

(a) Reimbursing the United States for the cost of administration of Part I of the FPA as determined by the Commission. The authorized installed capacity for that purpose is 689,400 kilowatts.

(b) Recompensing the United States for the use, occupancy, and enjoyment of 19,209.25 acres of its lands, other than for transmission line right-of-way. The Licensee shall pay a reasonable charge as determined by the Commission in accordance with its regulations, in effect from time to time.

(c) Recompensing the United States for the use, occupancy and enjoyment of 95.5 acres of its lands for transmission line right-of-way. The Licensee shall pay a reasonable charge as determined by the Commission in accordance with its regulations, in effect from time to time.

Article 202. (a) In accordance with the provisions of this article, the Licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands

and waters for certain types of use and occupancy, without prior Commission approval. The Licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the Licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article.

If a permitted use and occupancy violates any condition of this article or any other condition imposed by the Licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the Licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the Licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement.

To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the Licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The Licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the Licensee shall: (1) inspect the site of the proposed construction; (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline.

To implement this paragraph (b), the Licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy or project lands and waters, which may be subject to the payment of a reasonable fee to cover the

Licensee's costs of administering the permit program. The commission reserves the right to require the Licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines or procedures.

(c) The Licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir.

No later than January 31 of each year, the Licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The Licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year.

At least 60 days before conveying any interest in project lands under this paragraph (d), the Licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed used, the identify of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the Licensee to file an application for prior approval, the Licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the Licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the Licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved exhibit R or approved report on recreational resources of an exhibit E; or, if the project does not have an approved exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to insure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the Licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from

the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised exhibit G or K drawings would be filed for approval for other purposes.

Articles 301. The Licensee shall reserve a maximum of 120,000 acre-feet of storage space in Ross reservoir for flood control during the period from October 1 through, and to include, March 15.

The required storage space, if not previously obtained through power withdrawals, shall be provided by drawing down the reservoir at a rate equaling or exceeding a uniform drawdown rate from zero on October 1 to a rate that provides 60,000 acre-feet on November 15 and similarly drawing down, but at a more rapid rate, to provide the full 120,000 acre-feet on December 1, with the reservoir level at elevation 1,592.0 feet.

Whenever the National Weather Service, Northwest River Forecast Center, forecasts that the natural flow at the gaging station near Concrete, Washington will equal or exceed 90,000 cubic feet per second (cfs) in 8 hours on a rising stage of a flood, the Licensee shall, as a maximum, release only such flows from Ross dam as are necessary to the normal production of electric energy at Ross, Diablo, and Gorge plants, but not more than a mean daily discharge of 5,000 cfs, plus or minus 20 percent allowance for operational latitude.

If the reservoir pool should reach the elevation of 1,602.5 feet before the flood recession occurs, the gates shall be operated to produce maximum surcharge storage to gain the maximum reduction of discharge downstream. If surcharge storage is produced it shall be maintained as long as possible, or until flood recession occurs. After flood recession starts, releases from Ross reservoir shall be increased until discharge equals inflow. Storage shall be evacuated as rapidly as possible without endangering downstream installations as soon as the discharge at Concrete recedes to 90,000 cfs and a falling trend is predicted.

The document entitled "Details of Regulation for Use of Storage Allocated for Flood Control in Ross Reservoir, Skagit River, Washington (revised May 25, 1967)," prepared by the U.S. Army Corps of Engineers and Seattle, is incorporated by reference as a part of this article.

Article 302. The Licensee, for the limited purpose of making flood control operational changes, shall comply with requests for operational changes made by the Corps of Engineers, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Army, after notice and opportunity for hearing.

Article 303. Within 90 days of license issuance, the Licensee shall file for Commission approval revised exhibits M describing the project as built.

Article 401. Within 180 days of license issuance, the Licensee shall file with the Commission for approval a Project Fishery Resources Plan (Project Fishery Plan) to minimize impacts of the operation of the Skagit River Project on fishery resources, including related spawning grounds and habitat. The Project Fishery Plan shall implement the following provisions of the Fisheries Settlement Agreement incorporating the Anadromous Fish Flow Plan and the Anadromous and Resident Fish Non-flow Plan. The Project Fishery Plan shall address at a minimum, the following: (1) oversight and coordination with the Flow Plan Coordinating Committee and the Non-flow Plan Coordinating Committee; (2) Ross Lake reservoir operations; (3) the anadromous fish flow plan; (4) flow insufficiency; (5) flow limitations; (6) operating considerations; (7) monitoring and compliance; (8) the anadromous and resident fish non-flow plan, (9) program managers; (10) anadromous fish programs; (11) County Line and Newhalem Ponds; and (12) resident trout protection and production programs. The Project Fishery Plan shall address the requirements of Articles 402 through 408 of the license, including descriptions, schedules, funding mechanisms and project "islands", if any, established for off-site mitigation.

The Licensee shall prepare the Project Fishery Plan after consultation with the National Park Service; U.S. Fish and Wildlife Service; U.S. Bureau of Indian Affairs; U.S. Forest Service; National Marine Fisheries Service; Upper Skagit Tribe, Sauk-Suiattle Tribe and Swinomish Tribal Community; Washington Department of Fisheries; Washington Department of Wildlife; and the North Cascades Conservation Council. The Licensee shall allow a minimum of 30 days for the signatories to the Fisheries Settlement Agreement to comment and to make recommendations on the Project Fishery Plan before filing it with the Commission. The Licensee shall include in its filing documentation of such consultation including copies of the comments and recommendations on the proposed plan received during the consultation. Further, the Licensee should identify in its filing how the comments or recommendations are accommodated by the proposed plan. If the Licensee does not adopt a recommendation of a consulted entity, the filing shall include the Licensee's reasons, based on project specific information. The Commission reserves the right to require changes to the Project Fishery Plan. Upon Commission

approval, the Licensee shall implement the Project Fishery Plan, including any changes required by the Commission.

Article 402. The Licensee shall, in accordance with Section 2.4.2 of the Fisheries Settlement Agreement, host an annual meeting of the relevant agencies and tribes, interested parties, and Commission staff to facilitate coordination of implementation of the articles of this license. The Licensee shall file a summary of the meeting with the Commission.

Article 403. The Licensee shall fill Ross Lake as early and as full as possible after April 15 each year, in accordance with Section 4.1 of the Fisheries Settlement Agreement. Full pool in Ross Lake shall be achieved by July 31 each year and maintained until Labor Day weekend, subject to adequate runoff, anadromous fisheries protection flows, flood protection, minimized spill, and firm power generation needs (i.e., firm load, the minimum amount of power which the Licensee is obligated to provide from a combination of generation and contract resources for the use of its customers). In any overdraft year (i.e., in those years in which Ross Lake is drafted below the energy content curve), the Licensee shall bring Ross Lake level up to the Variable Energy Content Curve no later than March 31, subject to the constraints and hydrologic conditions described above.

Article 404. The Licensee, in the Project Fishery Plan, shall address flows for protecting anadromous fishery resources in the mainstem Skagit River downstream of the Gorge powerhouse, in accordance with Section 6.0 of the Fisheries Settlement Agreement. Where minimum flows required for incubation and fry protection for the various species of anadromous salmon or steelhead spawning groups overlap in time, the Licensee shall provide the highest minimum flow indicated on any particular day.

(1) Salmon

(a) Salmon Redd Protection. For spawning salmon and subsequent protection of redds in the Skagit River below the Gorge Development, the Licensee shall release water from the Gorge Development so as to limit maximum flow levels during spawning, and maintain minimum flows throughout the incubation period that are adequate to keep most redds covered until the fry emerge, consistent with Section 6.3 of the Fisheries Settlement Agreement.

(b) Salmon Fry Protection. For newly emerged salmon fry in the Skagit River below the Gorge Development, the Licensee shall release water from the Gorge Development so as to limit the daily downramp amplitude, maintain minimum flows throughout the salmon fry protection period that are adequate to cover areas of gravel bar commonly inhabited by salmon fry, and limit downramping to

nighttime hours except in periods of high flow, consistent with Section 6.3 of the Fisheries Settlement Agreement.

(2) Steelhead

(a) Steelhead Redd Protection. For spawning steelhead and subsequent protection of redds in the Skagit River below the Gorge Development, the Licensee shall release water from the Gorge Development so as to limit maximum flow levels during spawning, shape daily flows for uniformity over the extended spawning period, and maintain minimum flows through the incubation period that are adequate to keep most redds covered until fry emerge from the gravel, consistent with Section 6.3 of the Fisheries Settlement Agreement.

(b) Steelhead Fry Protection. For newly emerged steelhead fry in the Skagit River below the Gorge Development, the Licensee shall release water from the Gorge Development so as to limit daily downramp amplitude and maintain minimum flows throughout the steelhead fry protection period that are adequate to cover areas of gravel bar commonly inhabited by steelhead fry, and downramping will be limited to a very slow rate when Project discharge is moderately low and limited to a moderate rate when Project discharge is relatively high to minimize or prevent fry stranding on gravel bars, consistent with Section 6.3 of the Fisheries Settlement Agreement.

Article 405. The Licensee shall release water from the Gorge Development, including where appropriate reduced minimum instream flows, to provide suitable habitat conditions for salmon and steelhead in the Skagit River during years or seasons of exceptionally low flows, in accordance with Section 6.4 of the Fisheries Settlement Agreement. Flow insufficiency shall be defined as water conditions during a month or months characterized by abnormally low precipitation and sidestream runoff that has the potential to result in a failure to refill Ross Lake by July 31 or empty Ross Lake if operations continue to draft at the rate determined by minimum required flows.

The Licensee shall identify those circumstances for which the effect of Settlement Agreement shall be limited due to the Licensee's inability to react to or control the flows or operating factors that affect fish, in accordance with Section 6.5 of the Fisheries Settlement Agreement and developed in consultation with the Parties to the Fisheries Settlement Agreement. If the flows are modified due to an emergency condition, the Licensee shall notify the Fisheries Settlement Agreement signatories immediately and file a report with the Commission as soon as possible, but no later than 10 days after each such incident.

Article 406. The Licensee shall file project power planning reports and scheduling procedures, in accordance with Section 6.6 of the Fisheries Settlement Agreement and developed in consultation with the Parties to the Fisheries Settlement Agreement. The schedules of hourly generation during each calendar day shall be prepared in advance on the preceding Power Scheduling Day, in accordance with Section 6.6.2 of the Fisheries Settlement Agreement. Malfunctions of instruments affecting fish flow requirements for a period longer than 24 hours shall be reported immediately to the Fisheries Settlement Agreement signatories and a report must be filed with the Commission as soon as possible, but no later than 10 days after each such incident.

Article 407. The Licensee shall verify the Effective Spawning Habitat Model and the Temperature Unit Model, in accordance with Section 6.7.1 of the Fisheries Settlement Agreement.

The Licensee shall conduct field monitoring studies and surveys, in accordance with Section 6.7.2 of the Fisheries Settlement Agreement. The studies shall include: (1) Salmon Spawning Start and End Dates; (2) Steelhead Fry Protection Period Start and End Dates; and (3) Fry Stranding Surveys.

The Licensee shall conduct compliance monitoring, in accordance with Section 6.7.3 of the Fisheries Settlement Agreement. The Licensee shall record and make available to the Commission and all signatories to the Fisheries Settlement Agreement complete records of the real-time flow data measured at the gauging stations of the U.S. Geological Survey at Newhalem and Marblemount, and prepare semi-annual reports (January 1-June 30 and July 1-December 31) to demonstrate compliance with flows and operating restrictions embodied in this license and the Fisheries Settlement Agreement. The semi-annual reports shall be sent to the signatories to the Fisheries Settlement Agreement and to the Commission within 120 days of the end of the reporting period. Seattle may file these reports within 150 days during the first 5 years of the license.

The semi-annual reports shall include, but not be limited to the following: 1) minimum flows recorded at Newhalem gage; 2) hourly ramping rates during salmon and steelhead fry protection periods; 3) daily predicted Marblemount flows during the salmon fry protection period; 4) mean daily tributary inflow; 5) daily total downramp amplitude and portion of amplitude that occurred at Newhalem gage flows less than 4,000 cfs during salmon and steelhead fry protection Periods; 6) daily required instantaneous incubation flows based on Appendices C and G of the Fisheries Settlement Agreement; 7) the season spawning flow or spawning flows calculated to date for each salmon species or steelhead spawning group; 8) documentation and explanation of any flow violations; 9) calculated daily spawning flows; 10) planned

spawning flow for each species spawning or incubating during the reporting period; 11) list of daily flows calculated from the Spawning Control Curve for steelhead; 12) documentation of any decision to exercise a limitations clause (per Section 6.5 of the Fishery Settlement Agreement), including consultations with Parties to the Fisheries Settlement Agreement; 13) documentation of any emergencies that caused deviation from these License Articles and the Fisheries Settlement Agreement; 14) summary list of actions recommended during consultation with the parties and submitted to the Commission for approval during the reporting period; 15) daily fry protection flows as listed in Appendix I of the Fisheries Settlement Agreement; and 16) applicable minimum flows for the reporting period.

Article 408. The Licensee shall develop measures to address residual impacts and habitat losses for fishery resources due to operation of the Skagit River Project. The Licensee shall make available to the Washington Department of Fisheries and Wildlife and the Tribes a maximum of $6,320,000, to implement non-flow measures with objectives, program management, schedules, and funding in accordance with Section 7 of the Fisheries Settlement Agreement. The Licensee shall include measures for steelhead smolt production, chinook research, off-channel chum habitat development and improvement, County Line and Newhalem ponds, instream or off-channel habitat improvement and sediment reduction program, and provisions for resident trout protection and production.

The Licensee shall file with the Commission an annual report and a final report for each such non-flow program, in accordance with Section 7.2 of the Fisheries Settlement Agreement. Each program annual report shall be filed within 60 days following the anniversary date of the license and include a budget report and a prospective work plan for the next reporting period and budget plan for the next two reporting periods. The individual program annual reports shall include requirements specific to that program as described in the Fisheries Settlement Agreement (Sections 7.3 through 7.6). Each program final report shall be filed with the Commission within one year of completion of the program and shall summarize the objectives, methods, and results of the program. The Commission reserves the right, after notice and opportunity for hearing to modify this funding and contribution arrangement, including ordering a suspension or cessation of contributions and expenditures, should it be necessary or appropriate.

Article 409. Within 180 days of license issuance, the Licensee shall file with the Commission for approval a Project Soil Erosion Control Plan (Project Erosion Plan) to control erosion and slope instability and to minimize the quantity of sediment resulting from operation of the Skagit River Project. The Project Erosion Plan shall implement the following provisions

of the Settlement Agreement Concerning Erosion Control and the Erosion Control Plan filed by the Licensee on April 30, 1991 for the 37 project-related recreation and project facility sites and the 18 project-related road sites. The Project Erosion Plan shall include, at a minimum: (1) descriptions of the erosion control sites, (2) descriptions and schedules for implementing passive and active erosion control measures, (3) a schedule for construction of the greenhouse facilities, (4) a description and implementation schedule of a plant propagation program for the primary purpose of supplying plant stock for erosion control, and (5) provisions for funding the implementation of the Project Erosion Plan.

The Licensee shall prepare the Project Erosion Plan after consultation with the U.S. Department of Interior, National Park Service. The Licensee shall allow a minimum of 30 days for the National Park Service to comment and to make recommendations on the Project Recreation Plan before filing it with the Commission. The Licensee shall include in its filing documentation of such consultation including copies of the comments and recommendations on the proposed plan received during the consultation. Further, the Licensee should identify in its filing how the comments or recommendations are accommodated by the proposed plan. If the Licensee does not adopt a recommendation of a consulted entity, the filing shall include the Licensee's reasons, based on project specific information. The Commission reserves the right to require changes to the Project Erosion Plan. Upon Commission approval, the Licensee shall implement the Project Erosion Plan, including any changes required by the Commission. The Licensee shall provide the National Park Service a maximum of $845,000 for erosion control works at the sites specified in Table 5-1 of the Settlement Agreement Concerning Erosion Control and a maximum amount of $500,000 for measures at new sites. The Licensee shall file the National Park Service annual accounting and funding report, pursuant to Section 6.4 of the Settlement Agreement Concerning Erosion Control, with the Commission. The Commission reserves the right, after notice and opportunity for hearing to modify this funding and contribution arrangement, including ordering a suspension or cessation of contributions and expenditures, should it be necessary or appropriate.

Article 410. Within 180 days of license issuance, the Licensee shall file with the Commission for approval, a plan to implement those portions of the Settlement Agreement Concerning Wildlife (Wildlife Agreement), and the Wildlife Habitat Protection and Management Plan (Wildlife Plan), filed by the Licensee on April 30, 1991, which concern providing and renovating an historic building (Bunkhouse #10) in the town of Newhalem to house a research facility, and certain correlative research and monitoring activities. The plan shall include, at a minimum: (1) a schedule for converting Bunkhouse #10 into a research facility and providing equipment for the building; (2) a

description of all funding to be provided, the use of such funds, and a schedule for fund disbursement (all dollar amounts must be expressed in 1990 dollars with provisions for annual adjustments, in the year of payment, for changes in the Consumer Price Index for All Urban Consumers as published by the U.S. Department of Labor for the Seattle metropolitan area), (3) provisions for operating and maintaining the facility, (4) a copy of any lease agreement related to the facility, (5) a schedule for submitting reports on the activities of the Wildlife Research Advisory Committee; and (6) a schedule for filing reports of all research and monitoring activities planned and carried out in relation to the research facility, including reports on research results. The Commission reserves the right, after notice and opportunity for hearing to modify this funding and contribution arrangement, including ordering a suspension or cessation of contributions and expenditures, should it be necessary or appropriate.

The Licensee shall prepare the plan after consultation with the U.S. National Park Service, the U.S. Fish & Wildlife Service, the U.S. Bureau of Indian Affairs, the U.S. Forest Service, the Washington Department of Wildlife, the Upper Skagit Tribe, the Sauk-Suiattle Tribe, the Swinomish Indian Tribal Community, the Nlaka'pamux Nation, and the North Cascades Conservation Council. The Licensee shall allow a minimum of 30 days for these entities to comment and to make recommendations on the plan before filing the plan with the Commission. The Licensee shall include in its filing documentation of such consultation, including copies of the comments and recommendations on the proposed plan received during the consultation. Further, the Licensee should identify in its filing how the comments or recommendations are accommodated by the proposed plan. If the Licensee does not adopt a recommendation of a consulted entity, the filing shall include the Licensee's reasons, based on project-specific information. The Commission reserves the right to require changes to the plan. Upon Commission approval, the Licensee shall implement the plan, including any changes required by the Commission.

Article 411. Within 180 days of license issuance, the Licensee shall file for Commission approval a Project Aviation Marker Plan (Project Marker Plan) to install powerline identifiers, such as aviation spheres, on the project transmission line at river crossings, in order to protect bald eagles at the project. The Project Marker Plan shall include, but not be limited to, the following: (1) the size and color of markers to be used, (2) the spacing of markers and (3) the locations of line crossings where markers will be installed.

The Licensee shall prepare the Project Marker Plan after consultation with the U.S. Fish and Wildlife Service. The Licensee shall allow a minimum of 30 days for the Fish and Wildlife Service to comment and to make recommendations on the

Project Marker Plan before filing it with the Commission. The Licensee shall include in its filing documentation of such consultation including copies of the comments and recommendations on the proposed plan received during the consultation. Further, the Licensee should identify in its filing how the comments or recommendations are accommodated by the proposed plan. If the Licensee does not adopt a recommendation of a consulted entity, the filing shall include the Licensee's reasons, based on project specific information. The Commission reserves the right to require changes to the Project Marker Plan. Upon Commission approval, the Licensee shall implement the Project Marker Plan, including any changes required by the Commission.

Article 412. Within 180 days of license issuance, the Licensee shall file for Commission approval a Project Recreation Plan implementing the following provisions of the Settlement Agreement on Recreation and Aesthetics and the Report on Recreation Resources filed by the Licensee on April 30, 1991. The Project Recreation Plan shall include, at a minimum, schedules, descriptions, project "islands", if any, established for off-site mitigation and funding proposals for the following continuing, mitigative and enhancement measures.

Continuing measures shall, in accordance with Section 3.3 of the Settlement Agreement on Recreation and Aesthetics, include: (1) guided tours of the Ross and Diablo Hydroelectric facilities; (2) operation of the tugboat/ferry service on Diablo Lake; (3) operation of a visitor contact station in Newhalem; (4) maintenance of picnic facilities available for public use in Newhalem and Diablo; (5) maintenance of the Ladder Creek Falls trail near the Gorge powerhouse; and (6) repair or replacement of the underwater electric cable for the campground at Colonial Lake on Diablo Lake.

Mitigative measures shall, in accordance with Section 3.4 of the Settlement Agreement on Recreation and Aesthetics, include: (1) funding of modification of boat access facilities at the Hozomeen Boat Ramp to provide adequate access to Ross Lake, up to a maximum of $150,000; (2) funding of modification or replacement of selected docks along Ross Lake, up to a maximum of $308,000; (3) funding of modification of facilities at the Gorge Lake Boat Ramp, up to a maximum of $150,000; and (4) funding of modification of facilities at the Colonial Creek Boat Ramp, up to

a maximum of $125,000.

Enhancement measures shall, in accordance with Section 3.5 of the Settlement Agreement on Recreation and Aesthetics, include: (1) remodeling or replacing the Newhalem Visitor Contact Station; (2) funding the initial site redevelopment of the Goodell Creek Raft Access Site, up to a maximum of $65,000; (3) funding the improvements to the Damnation Creek Boat-in Picnic Site, up to a

maximum of $25,000; (4) contributions for improvements to the U.S. portion of the Hozomeen Water Distribution System, up to a maximum of $50,000; (5) funding the initial development of the North Cascades Environmental Learning Center and contribute to its long-term operation and maintenance; (6) funding improvements to the Gorge Creek overlook, up to a maximum of $175,000; (7) funding improvements to the Thunder Lake Fishing Facility up to a maximum of $200,000; (8) funding improvements to the Thunder Knob Trail and funding the development of a new loop trail system around the top of Thunder Knob, above the south side of Diablo Lake, up to a maximum of $210,000; (9) funding development of the Happy Flats-Panther Creek Trail, up to a maximum of $155,000; (10) funding construction of the Desolation-Hozomeen Trail, up to a maximum of $275,000; (11) funding of new interpretive facilities, up to a maximum of $150,000 to be spent on facilities in the Ross Lake National Recreation Area; (12) funding a bicycle facility needs assessment and for capital facilities to implement the study, up to a maximum of $175,000; (13) administering recreation utilization and needs assessments, up to a maximum of $125,000; (14) funding new capital facilities identified by the recreation needs assessments, up to a maximum of $312,500; and (15) funding ongoing operation and maintenance costs of recreation facilities within the Ross Lake National Recreation Area for the first fifteen years of the new license term, up to a maximum of $60,000 per year; from the sixteenth through the twenty-fifth years of the new license term, up to a maximum amount of $80,000 per year; for the next five years, up to a maximum of $100,000 per year.

The Licensee shall prepare the Project Recreation Plan after consultation with the National Park Service; U.S. Forest Service; Upper Skagit Tribe, Sauk-Suiattle Tribe, and Swinomish Indian Tribal Community; and North Cascades Conservation Council. The Licensee shall allow a minimum of 30 days for these entities to comment and to make recommendations on the Project Recreation Plan before filing it with the Commission. The Licensee shall include in its filing documentation of such consultation including copies of the comments and recommendations on the proposed plan received during the consultation. Further, the Licensee should identify in its filing how the comments or recommendations are accommodated by the proposed plan. If the Licensee does not adopt a recommendation of a consulted entity, the filing shall include the Licensee's reasons, based on project specific information. The Commission reserves the right to require changes to the Project Recreation Plan. Upon Commission approval, the Licensee shall implement the Project Recreation Plan, including any changes required by the Commission. The Commission reserves the right, after notice and opportunity for hearing to modify this funding and contribution arrangement, including ordering a suspension or cessation of contributions and expenditures, should it be necessary or appropriate.

Article 413. Within 180 days of license issuance, the Licensee shall file for Commission approval a Project Visual Quality Plan implementing the following provisions of the Settlement Agreement on Recreation and Aesthetics and the Report on Aesthetics filed by the Licensee on April 30, 1991. The Project Visual Quality Plan shall, in accordance with Section 4.2 of the Settlement Agreement on Recreation and Aesthetics, include at a minimum implementation schedules, descriptions and provisions for required funding mechanisms for the following: (1) filling the Ross Lake reservoir as early as possible after April 15 and keeping it full through the Labor Day weekend consistent with other resource management constraints; (2) painting project transmission line towers a less visually contrasting color; (3) painting the two surge tanks above the Diablo and Gorge powerhouses a less visually contrasting color; (4) painting the structural steel bridge on the Gorge Dam access road bridge a less visually contrasting color; (5) redesigning or modifying the Ross Dam Broome Gate Shed to decrease its contrast; (6) removing the Diablo person lift; (7) providing high angle cut-off shielding for all exterior lighting and/or replace the mercury or low intensity sodium exterior lamps with high-intensity sodium lamps at the three powerhouses to the extent consistent with safe project operations; (8) replacing shiny, high contrast or reflective galvanized or aluminum roofing/siding on buildings in Newhalem and Diablo with more visually compatible material; (9) avoiding increasing the contrast of existing project facilities; (10) improving the visual quality of Newhalem and Diablo towns; (11) improving the visual quality of Engineering Row in Newhalem, including removal of three storage buildings; (12) developing a new greenhouse for the project across from Engineering Row; (13) developing a parking area on SR 20 within the town of Newhalem; (14) providing adequate parking for employees and visitors at the powerhouse and at the Ladder Creek Falls Trail; (15) improving the visual quality of the Town of Diablo and the Diablo Visitor Center; (16) maintaining project rights-of-way (ROW) for visual quality purposes; and (17) applying a range of vegetation management prescriptions to reduce the visual impacts of project rights-of-way.

The Licensee shall prepare the Project Visual Quality Plan after consultation with the National Park Service; U.S. Forest Service; Upper Skagit Tribe, Sauk-Suiattle Tribe, and Swinomish Indian Tribal Community; and North Cascades Conservation Council. The Licensee shall allow a minimum of 30 days for these entities to comment and to make recommendations on the Project Visual Quality Plan before filing it with the Commission. The Licensee shall include in its filing documentation of such consultation including copies of the comments and recommendations on the proposed plan received during the consultation. Further, the Licensee should identify in its filing how the comments or recommendations are accommodated by the proposed plan. If the

Licensee does not adopt a recommendation of a consulted entity, the filing shall include the Licensee's reasons, based on project specific information. The Commission reserves the right to require changes to the Project Visual Quality Plan. Upon Commission approval, the Licensee shall implement the Project Visual Quality Plan, including any changes required by the Commission.

Article 414. The Licensee shall implement the provisions of the Memorandum of Agreement By and Among the Federal Energy Regulatory Commission; the Washington State Historic Preservation Officer; the Advisory Council on Historic Preservation; the U.S. Federally Recognized Sauk-Suiattle Tribe, the Swinomish Tribal Community, and the Upper Skagit Tribe; the Nlaka'pamux Nation; and the City of Seattle Regarding the Skagit River Hydroelectric Project and the provisions of the Memorandum of Agreement By and Among the Federal Energy Regulatory Commission; the Washington State Historic Preservation Officer; the Advisory Council on Historic Preservation; the U.S. Department of the Interior, National Park Service; the U.S. Federally Recognized Sauk-Suiattle Tribe, the Swinomish Tribal Community, and the Upper Skagit Tribe; and the City of Seattle Regarding the Skagit River Hydroelectric Project.

The Licensee shall provide $1,817,000 for the duration of the license as called for in the agreement regarding archaeological and historic resources, $1,316,669 as called for in the agreements with the Upper Skagit Tribe, the Swinomish Indian Tribal Community, and the Sauk-Suiattle Tribe regarding traditional Cultural Properties, and $600,000 as called for in the agreement with the Nlaka'pamux Nation. These dollar amounts are expressed in 1990 dollars and shall be adjusted annually, in the year of payment, for changes in the Consumer Price Index for All Urban Consumers as published by the U.S. Department of Labor for the Seattle metropolitan area. The Commission reserves the right, after notice and opportunity for hearing to modify this funding and contribution arrangement, including ordering a suspension or cessation of contributions and expenditures, should it be necessary or appropriate.

Article 415. Within 90 days of license issuance, or before October 1 of each year for the following year, in accordance with the articles of this license and the Commission's Uniform System of Accounts, the Licensee shall file a Project Expenditures Plan for Commission approval which shows the amounts of money the Licensee will spend or contribute pursuant to the license funding provisions and all expenses to be paid from these funds for the following year, including funds provided to other federal and state agencies. The Commission reserves the right to require changes in the Project Expenditures Plan. Upon Commission approval, the Licensee shall implement the Project Expenditures Plan, including any changes required by the Commission.

The Licensee shall also file with the Commission an annual statement on or before April 1 of each year for the previous calendar year, in accordance with the Commission's Uniform System of Accounts, showing the amounts of money the Licensee has spent or contributed pursuant to the license funding provisions and all expenses paid from these funds, including funds provided to federal and state agencies. The filing should also include signed statements from the signatory agencies of monies received from the Licensee pursuant to the license funding provisions all expenses paid from these funds. These statements shall be in sufficient detail to show whether the monies have been contributed and spent on the approved purposes.

Article 416. Within 90 days of license issuance, the Licensee shall file for Commission approval revised Exhibits F and K, including a showing of the acreage of federal lands within the project boundary and any off-site project islands required by this license.

(E) The Licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(F) The proceedings in Docket No. EL78-36 are terminated.

(G) The motion to intervene filed by the Sto:Lo Nation on February 24, 1995, is denied.

(H) This order is final unless a request for rehearing is filed within 30 days of the date of issuance of this order, pursuant to Section 313 of the FPA. The filing of a request for rehearing does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically ordered by the Commission. The Licensee's failure to file a request for rehearing shall constitute acceptance of this order.

By the Commission.

(S E A L)

Lois D. Cashell,
Secretary.

FINAL ENVIRONMENTAL ASSESSMENT FOR NEW HYDROPOWER LICENSE

Skagit River Hydroelectric Project

FERC Project No. 553

Washington

(Issued May 16, 1995)

prepared by

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
825 North Capital Street, NE
Washington, D.C.

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ACRONYMS, ABBREVIATIONS, AND INITIALISMS

AIRFA	American Indian Religious Freedom Act
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
BPA	Bonneville Power Administration
cfs	cubic feet per second
CMP	Coastal Management Program
Commission	Federal Energy Regulatory Commission
CSI	Compliance Services International
EA	Environmental Assessment
FCC	Flow Coordinating Committee
FPA	Federal Power Act
FS	U.S. Forest Service
FWCA	Fish and Wildlife Coordination Act
FWS	U.S. Fish and Wildlife Service
GWh	gigawatts per hour
HABS/HAER	Historic American Building Survey/Historic American Engineering Record Survey
HCA	habitat conservation area
HRMMP	Historic Resources Mitigation and Management Plan
IAC	Washington Interagency Committee for Outdoor Recreation
kV	kilovolts
kWh	kilowatt hours
MOA	Memorandum of Agreement
MW	megawatts
NCNP	North Cascades National Park
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPPC	Northwest Power Planning Council
NPS	National Park Service
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
ORNL	Oak Ridge National Laboratory
PAOT	people at one time
PCB	polychlorinated biphenyl
Plan	Northwest Conservation and Electric Power Plan
PNUCC	Pacific Northwest Utilities Conference Committee
RLNRA	Ross Lake National Recreation Area
RM	river mile
RV	recreational vehicle
SA	Offer of Settlement with Settlement Agreements
SCL	Seattle City Light Department
SHPO	State Historic Preservation Officer
SRP	Skagit River Project
TCP	traditional cultural property
Tribes	the Upper Skagit Tribe, Sauk Suiattle Tribe, Swinomish Indian Tribal Community, and Nlaka'pamux Nation
USDI	U.S. Department of the Interior
USGS	U.S. Geological Survey
WDF	Washington Department of Fisheries
WDOE	Washington Department of Ecology
WDW	Washington Department of Wildlife

EXECUTIVE SUMMARY

This environmental assessment (EA) is prepared by the Federal Energy Regulatory Commission (Commission), in accordance with the provisions of the National Environmental Policy Act, to evaluate the environmental impacts of continuing operation of the Skagit River Project (SRP, FERC No. 553) in Whatcom County, Washington. The SRP consists of the Ross, Diablo, and Gorge reservoirs with installed capacities of 360, 122.4, and 207 megawatts, respectively. The applicant and current licensee, Seattle City Light Department (SCL), proposes to continue operating the SRP under a new license. The SRP has been operated under an annual license since 1977, when the previous license expired. A draft EA was issued for public review and comment on March 4, 1994.

This EA evaluates three alternatives. The first alternative is the staff recommended proposed action relicensing the SRP in accordance with the terms of an Offer of Settlement and various supporting settlement agreements (SA collectively). Extensive negotiations between SCL and local, state, federal, and tribal government entities and environmental organizations resulted in the SA before the Commission. Parties to the SA included SCL, the National Park Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Forest Service, National Marine Fisheries Service, Washington Department of Fisheries, Washington Department of Wildlife, North Cascades Conservation Council, Upper Skagit Tribe, Sauk Suiattle Tribe, Swinomish Indian Tribal Community, and the Nlaka'pamux Nation.

The specific supporting agreements in the SA address environmental concerns for erosion control, fisheries, wildlife, recreational and aesthetic, and cultural resources (including archaeologic and historic resources and traditional cultural properties). These agreements proposed measures to lessen environmental impacts of project operations and to enhance important nondevelopmental resources (resources other than electric power generation resources) in the Skagit River Basin.

In the next alternative, we considered several additional measures and alternative approaches to dealing with the environmental concerns associated with the SRP. These measures, summarized in Section III.A.3 of this EA, include alternative flow and nonflow measures to address fisheries concerns, additional monitoring and reporting requirements for downstream sedimentation, additional erosion control requirements, and further study of visual and cultural resources.

The last alternative considered, the no-action alternative, would retain the current environmental setting and provide for continued operation of the SRP as it has operated in the past. None of the environmental enhancement measures provided for in

the SA, except those already established by interim agreements, would be implemented under this option.

In Section V of this EA we describe the environment in the SRP vicinity and evaluate the impacts of the proposal and of other measures that we considered. We focus on important resources, which include fisheries, vegetation and wildlife, visual resources, cultural resources, and land use and recreation. Because these resources are frequently affected by slope stability, we also consider geology and soils.

Under the proposed action, SCL would implement or continue measures as follows, with the indicated effects:

- flow would continue to be managed to improve conditions for salmon and steelhead spawning, redds and fry in the river;
- additional nonflow measures would be implemented for enhanced steelhead production, chinook salmon research, fish habitat development, sediment reduction and trout protection and production;
- a short reach of the river would continue to be dewatered and the slight detriment to resident and anadromous fish would persist;
- the reservoirs would continue to occupy what was formerly terrestrial wildlife habitat;
- wildlife habitat in the basin would be improved and enhanced through habitat acquisition and improvement;
- recreational facilities associated with the SRP would be improved, including erosion control measures;
- visual quality would be enhanced through repair of facilities, screening, and revegetation;
- archaeologic and historic resources would be protected through refurbishment of facilities, education, interpretation, and information gathering;
- Native American tribes would be compensated to enhance traditional cultural properties.

We also evaluated the SA with some minor additions and alternative enhancements. We determined that the SA with these minor additions or alternatives would provide the same general level of environmental benefits as the SA alone but at some additional cost. Because this option would not substantially improve the environmental resources, we consider the SA alone as

the better alternative. The no-action alternative would forego some of the benefits to fisheries and all of the enhancements to wildlife and to recreational, aesthetic, and cultural resources.

The Commission's staff has selected as the preferred alternative the issuance of a new license for the SRP containing the measures recommended in the SA which are appropriate for adoption as license conditions. This option would permit the best comprehensive development of the Skagit River. Based on our independent review and analysis of the proposed action (continued operation under the terms of the SA), we conclude that issuance of a new license for the SRP, as proposed in the SA, would not constitute a major federal action significantly affecting the quality of the human environment.

Skagit River Hydroelectric Project, Washington
FERC Project No. 553

INTRODUCTION

The Federal Energy Regulatory Commission (Commission) issued the draft environmental assessment on the Skagit River Project for comment on March 4, 1994. In response, we (the Commission staff) received 9 letters that are listed in section IV.B of this environmental assessment (EA). In most cases, appropriate changes and corrections have been made to the text in response to the comments. In other instances, an additional explanation has been added to explain why some comments were not fully incorporated. Our responses are explained on the adjacent page of the letters of comment in Appendix A.

I. APPLICATION

The Skagit River Project (SRP) consists of three reservoirs located on the Skagit River in Whatcom County, Washington (figure 1). Originally licensed in 1927, the SRP (figure 2) has been operating since the early 1920s, with the most recent license issued in 1968. Seattle City Lights's (SCL's) license to operate the SRP expired in 1977. In 1977, SCL submitted an application for relicense (revised in 1978), and has been operating under an annual license since 1977.

Since the application for relicense was filed, settlement agreements have been negotiated between SCL and various entities (Section IV.A). As a result, the environmental issues associated with relicensing the SRP have been resolved to the satisfaction of SCL and state, federal, and tribal entities. In April 1991, SCL filed an Offer of Settlement (SCL 1991a) and the various settlement agreements with supporting reports (SCL 1991b-o), collectively termed the SA herein, with the Commission; additional agreements (SCL 1993a, b) were filed in 1993 and became part of the SA. The SA superseded, in part, the original application for relicense and set forth the provisions of the SRP currently proposed for relicense.

II. PURPOSE AND NEED FOR ACTION

A. Purpose of Action

SCL proposes to continue operating a hydroelectric project with an installed capacity of about 690 megawatts (MW) at its three existing dams. The Federal Power Act (FPA) provides the Commission with the exclusive authority to license nonfederal

See map on page 2 of the hard copy.

Figure 1. Location and selected features of the Skagit River Basin and surrounding region, including the Ross, Diablo, and Gorge dams and reservoirs of the Skagit River Project. (Source: The staff.)

See map on page 3 of the hard copy.

Figure 2. The Skagit River Project and major project features. (Source: The staff.)

water power projects on navigable waterways and federal lands. Thus, the Commission must decide whether and under what terms to issue a new license for the SRP. This EA evaluates the impacts associated with relicensing the SRP as set forth in the SA, considers additional and alternative measures to meet environmental concerns, recommends to the Commission whether to issue a new license, and recommends terms and conditions to become a part of any license issued.

In deciding whether to issue SCL a license, the Commission must determine that the project adopted will be best adapted to a comprehensive plan for improving or developing the Skagit River. In addition to the power and developmental purposes for which licenses are issued, the Commission must give equal consideration to the purposes of energy conservation; the protection, mitigation of damages to, and enhancement of fish and wildlife resources (including related spawning grounds and habitat); the protection of recreational opportunities; and the preservation of other aspects of environmental quality. This EA addresses these considerations.

B. Need for Power

The City of Seattle, a municipality organized under the laws of the State of Washington, operates a municipal electric utility system through SCL. The system supplies public utility services to city residents, over 300,000 customers. The power generated by the SRP project supplies a substantial portion of the system's needs, supplemented by power from thermal plants and other sources. SCL serves about 75 percent of its load with owned and contracted resources, and relies on purchases from Bonneville Power Administration (BPA) to meet its remaining load. A need for more power is likely to exist in the Pacific Northwest sometime during the 1990s. Firm energy provided by the SRP would, depending on cost, help meet a part of the projected need.

The combined effect of (1) electrical load growth and (2) a fixed or declining level of existing generation makes necessary the addition of conservation, generating resources, or both, if adequacy and reliability levels are to be maintained. Four aspects affect the timing for adding more resources: the rate of load growth, load characteristics, the age and condition of existing resources, and system reliability criteria.

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Act) established the Northwest Power Planning Council (NPPC). The NPPC adopted a Northwest Conservation and Electric Power Plan (Plan) in 1983, amended in 1986, 1989, and 1991. The Plan includes a 20-year demand forecast and estimates of the resources available to meet future demand.

In the Plan, the NPPC recognizes that the future is uncertain and that it is not possible to forecast electrical energy needs accurately. To deal with this uncertainty, the Plan develops a range of growth scenarios and assumes a probability distribution to describe the likelihood that any given level of future electricity demand will occur. The NPPC predicts that if high load growth occurs, the region will need new resources as early as 1992. At the opposite extreme, the region would not need any new resources during the planning period if growth follows the low load path. In the more likely medium growth scenarios, the region will need new resources sometime between 1995 and 2004.

We also looked at the load projections and needs analyses of the BPA and the Pacific Northwest Utilities Conference Committee (PNUCC). BPA places a somewhat higher probability on the medium forecast than does the Plan and shows that more resources would be needed by 1994. The PNUCC projections of regional firm energy loads and resources show a need for more resources beginning in 1993 (PNUCC 1992).

Power from the SCL project would be useful in meeting some regional power needs or in meeting a portion of the current and future displacement potential identified by the NPPC. Power generated by the SRP would forestall the use of fossil-fueled electric power generation, thereby conserving fossil fuel and reducing noxious by-product emissions.

III. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

The proposed action is issuing a new license to operate the SRP as set forth in an Offer of Settlement (SCL 1991a) and associated settlement agreements (SCL 1993 a, b; 1991b o), collectively termed the SA herein (see Section III.A(e)(2)).

1. Project Description

This project description was developed by the Commission staff from information provided by the applicant. The SRP is located on the Skagit River in Snohomish, Skagit, and Whatcom counties, near the towns of Diablo, Newhalem, Marblemount, and Rockport, Washington (figures 1 and 2). The SRP occupies land within Ross Lake National Recreation Area (RLNRA) (figure 2). It consists of three developments, originally constructed in the 1920s, with a total installed capacity of about 690 MW and a transmission corridor to Bothell and Snohomish substations northeast of Seattle. The SRP also includes various recreational facilities, including picnic areas, camping sites, boat launches, and hiking trails.

a. Ross Development

Ross dam is located about 1 mile downstream from Ruby Creek and 11 miles upstream from Newhalem (figure 2). The existing dam is a concrete arch structure, rising 540 feet from bedrock to crest. The total storage capacity at maximum normal reservoir elevation (1,602.5 feet) is 1,435,000 acre-feet. The usable storage with maximum drawdown of 127.5 feet (to elevation 1,475 feet) is 1,052,000 acre-feet. The Ross Lake reservoir covers 11,680 acres and extends into Canada. Two 26-foot-diameter power tunnels, 1,800 feet long and 1,634 feet long, bring water from the reservoir to the power plant.

The power plant is located on the southeast bank, about 1,100 feet downstream from Ross dam. The four generating units in the powerhouse have a combined nameplate capacity of 360 MW. The normal maximum gross head is 401 feet between Ross reservoir at 1,602 feet and Diablo reservoir at elevation 1,201 feet.

b. Diablo Development

Diablo dam is located about 4.5 miles downstream from Ross dam (figure 2). The concrete arch dam rises 389 feet from bedrock to crest. Normal operation of Diablo reservoir ranges between elevation 1,205.0 and 1,201.5 feet. Occasionally, the reservoir is drawn down a few feet lower but seldom below elevation 1,197 feet. Diablo reservoir has a surface area of 770 acres and is used primarily for daily and weekly reregulation of the discharge from Ross powerhouse.

The power plant is located on the north bank of the Skagit River, about 4,000 feet downstream from Diablo dam. A 2,000-foot-long tunnel and two inclined steel pipelines convey water from the reservoir to the power plant. A surge tank is provided at the downstream end of the tunnel. The normal maximum gross head is 330 feet between Diablo reservoir at elevation 1,205 feet and Gorge reservoir at elevation 875 feet. The power plant contains four generating units with a combined nameplate capacity of 122.4 MW.

c. Gorge Development

Gorge dam is located about 4 miles downstream from Diablo dam (figure 2). The diversion dam near Gorge Creek is a combination concrete arch and gravity structure, rising 300 feet from bedrock to the crest. The maximum and normal reservoir level is at elevation 875 feet. The normal level surface area of the reservoir is 240 acres, and the total volume is 8,500 acre-feet. Gorge reservoir is usually kept full or near full to provide maximum head for the Gorge Power Plant.

The powerhouse is located on the south bank of the Skagit River, opposite the town of Newhalem (about 2.5 miles downstream from Gorge dam). A 20.5-foot-diameter, concrete-lined tunnel with a surge tank at the downstream end conveys water from the reservoir. Total length of the tunnel is about 11,000 feet. The bypassed reach of the Skagit River is about 2.5 miles long. The normal gross head is 380 feet between Gorge reservoir and the normal tailwater at elevation 495 feet. The power plant contains four generating units with a combined nameplate capacity of about 207 MW.

d. Transmission System

The SRP electrical transmission system follows the Skagit River downstream to Marblemount, goes up the Sauk River Valley to Darrington and out through the valley of the North Fork of the Stillaguamish River (figure 1). All circuits in the Skagit transmission system are 230-kV, on double-circuit steel towers. Diablo Circuits No. 1, No. 2 and No. 3 terminate at the Bothell Substation. The Go-NM line extends from the Gorge Substation to the North Mountain Substation. The Ross No. 1 line and the Ross No. 2 line are single-circuit lines which interconnect the Ross Substation and the Diablo Substation. Table 1 gives the approximate lengths of the six project primary lines. The North Mt.-SN line and the SN-BO lines carry power in both directions between the BPA System and the Seattle City Light system and, as a result, do not comply with our primary line definition.

e. Project Operation

The SRP currently uses all of the 1,107.5 feet of head available on the Skagit River from a location near the Canadian border to the tailrace at the Gorge power plant. The SRP has one storage reservoir at the Ross Development, while the Diablo and Gorge Developments have pondage with no significant storage capability. Seasonal regulation at the Diablo and Gorge developments is provided by Ross dam. Draft and refill of the Ross reservoir is governed by a rule curve based on regulation studies. This rule curve incorporates the flood control curve, assured refill curve, and fish protection flows. Reservoir operation is hydraulically coordinated with operation of other reservoirs and generating plants operated by the parties to the Pacific Northwest Coordination Agreement, to which SCL is a signatory.

Table 1. Skagit River Project 230-kV transmission lines. (Source: The staff.)

Designation	Section	Length (miles)
Ross No. 1	Ross to Diablo	3.80
Ross No. 2	Ross to Diablo	3.85
Diablo No. 1	Diablo to Bothell	87.20
Diablo No. 2	Diablo to Bothell	87.20
Diablo No. 3	Diablo to Bothell	87.20
GO-North Mt.	Gorge to North Mt.	39.00
North Mt.-SN	North Mt. to Snohomish	38.00
SN-BO	Snohomish to Bothell	5.70

The top 120,000 acre-feet of the Ross reservoir storage capacity and about 95,000 acre-feet of induced surcharge storage has been reserved for flood control usage pursuant to an agreement between SCL and the U.S. Army Corps of Engineers. Draft from top elevation must start no later than October 1 and the top 120,000 acre-feet of storage must be evacuated no later than December 1. After-March 15, refill to maximum elevation is permissible. Flood control storage is used at the discretion of the Corp's Seattle District Engineers if flows at the gage at Concrete are expected to exceed 90,000 cfs within 8 hours. The Corps may not, however, limit Ross dam discharges to less than power requirements (15,600 cfs) to be re-regulated through Diablo reservoir to a daily mean of 5,000 cfs. SCL attempts to refill all reservoirs to maximum elevations and maintain them at full capacity for the recreational season.

2. Background on the Project

SCL's 1977 application for relicense was opposed by agencies and tribes as not adequately addressing their environmental concerns for fisheries and other issues and because it proposed raising Ross dam. In 1981, an interim flow agreement was reached with some of the parties involved with relicensing this project (Docket No. EL78-36, Order Declaring Interim Settlement Effective and Partially Releasing a Condition, Issued July 24, 1981). The interim agreement provided for various studies, as well as a 2-year modification of the SRP's operating flow regime to enhance the Skagit River habitat for anadromous species. The interim flow agreement (with some modifications) has continued in effect

thereafter, along with ongoing biological studies and negotiations for the SRP. In April 1991, various parties (Section IV.A) presented an Offer of Settlement (SCL 1991a) to the Commission, which involved settlement agreements and supporting reports filed in 1991 and 1993 on fisheries, wildlife, erosion control, cultural resources, recreation and aesthetics, and traditional cultural properties (SCL 1991b o; 1993a, b). The parties consider the SA to " . . . resolve all issues for the period specified in each agreement related to the effects of the project, as currently constructed, upon the subject areas identified above" (Offer of Settlement).

The SA constitutes the proposed action evaluated in this EA. The SA established SCL's obligations to the various resources (i.e., fisheries, wildlife, recreation and aesthetics, erosion control, archaeological and historic resources, and traditional cultural properties) affected by its currently constructed SRP. The SA also established the SA participants' obligations to support the SRP operation with the SA-proposed enhancements relating to the various resources under any applicable provisions of the FPA, the Fish and Wildlife Coordination Act (FWCA), the Wild and Scenic Rivers Act, the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the American Indian Religious Freedom Act (AIRFA).

The SA resolved all issues among the parties related to the effects of the currently constructed SRP on various resources, and the signatories agreed that it constitutes adequate protection and compensation for resource losses and impacts caused by the SRP. The parties have agreed that each separate settlement agreement in the SA shall constitute a unit. The parties also requested that the Commission accept and approve the SA as a package. Any material modification of the terms of a particular settlement agreement, approval of less than the entire agreement, or the addition of any material terms to an agreement will make the agreement voidable at the option of any party. SCL and other parties reserve the right to appeal the issuance of a license if unacceptable provisions are added. The signatories intended that the provisions of the offer be included as articles of the Commission license. The agreement would take effect on the date the Commission issued a license consistent with the SA and would remain in effect for the duration of the license.

The 1977 application for relicensing included plans for raising Ross dam (High Ross) under an amendment to the original license approved in 1977. However, on July 2, 1980, the Commission granted SCL's request for a stay of opinions authorizing the amendment. In 1984, the United States and Canada entered into a treaty that has indefinitely delayed SCL's plans to raise the dam. On April 2, 1984, President Reagan signed "A Treaty Between the United States and Canada Relating to the Skagit River and Ross Lake in the State of Washington, and the

Seven Mile Reservoir on the Pend D'Oreille River in the Province of British Columbia" which was transmitted to the Senate on June 11, 1984. The primary purpose of the treaty was to provide the necessary legal bases for an arrangement whereby SCL would refrain from raising Ross dam and would receive in return a guaranteed long-term supply of electrical power from British Columbia (BC). The treaty authorizes SCL to raise Ross dam only if the province of British Columbia discontinues its obligation, undertaken in a separate agreement between the province and SCL, to deliver an equivalent amount of power to SCL. Thus, the High Ross alternative is neither currently proposed nor expected to be proposed, and it is not considered as an alternative in this EA. The relicense application also addressed other possible project modifications, including a new dam on the Skagit River near a small tributary named Copper Creek and the extension of existing water conduits. These modifications are no longer part of the proposed action.

3. Applicant's Proposed Enhancement Measures

Proposed enhancement measures are summarized in the SA filed in 1991 and 1993 on a number of issues. The SA covers fisheries, wildlife, recreation and aesthetics, erosion control, cultural resources (archaeological and historic resources), and traditional cultural properties (TCPs). These measures are summarized briefly below and are discussed for the various resources in Section V herein. All costs in this section are expressed in 1990 dollars. Because no new hydropower facilities are to be constructed, the proposed measures deal with operational considerations (e.g., fill and flow plans); mitigative measures for operational impacts (e.g., erosion protection); enhancement (e.g., recreational facilities); and compensation (e.g., payments to various parties).

a. Geology and Soils

Thirty-seven sites along the reservoir shoreline and 18 road sites have been identified in the SA for priority erosion control measures. These measures include the following:

- active erosion control measures on shorelines (placement of control structures and vegetation to halt or greatly reduce erosion), to maintain the natural and wilderness conditions of the SRP area; and

- passive measures (monitoring to obtain additional information on the processes and rates of erosion).

In addition, other erosion control work will be performed at sites identified during the license period. Proposed expenditures to accomplish these goals are $845,000 for

identified sites and $500,000 for new sites and maintenance over the license period.

b. Fisheries

To protect resident and migratory fish species, major terms of the fisheries part of the SA include the following:

- establishment of interagency coordinating committees for flow-related and nonflow-related issues;
- setting a filling schedule for Ross Lake consistent with flood control requirements;
- agreement on flows downstream of Gorge powerhouse to remove any need for flow releases in the Gorge bypassed reach;
- except during flood control regulation, limitation of maximum flow levels below Gorge powerhouse during salmon spawning and maintenance of minimum flows adequate to keep most redds covered until the fry stage throughout the incubation period;
- limitation of the daily rate of flow reduction to prevent stranding of newly emerged salmon fry, maintenance of minimum flows throughout the protection period that are adequate to cover areas of gravel bar commonly inhabited by salmon fry, and limitation of flow reduction to night hours except for periods of high flow;
- limitation of flow levels during steelhead spawning, maintenance of uniform daily flows over the extended spawning period, and maintenance of minimum flows adequate to keep most redds covered through the incubation period until fry emerge from the gravel;
- limitation of daily rate of flow reduction to prevent stranding of newly emerged steelhead fry, and maintenance of minimum flows throughout the fry protection period that are adequate to cover areas of gravel bar commonly inhabited by steelhead fry and to minimize or prevent fry stranding on gravel bars;
- establishment of the conditions, consultations, and alternative requirements for water years when flow in the basin is insufficient to meet the minimum instream flows;
- scheduling of hourly generation during each calendar day in advance on the preceding power scheduling day;

- specification of field monitoring to verify two models used in establishing flows, identifying salmon spawning start and end dates, identifying steelhead fry protection period start and end dates, and to monitor the effectiveness of fry protection measures by surveying for fry stranding; and

- designation of nonflow measures to compensate for continuing impacts in the formerly productive fish habitats that the SRP has rendered inaccessible, including measures for steelhead production, chinook salmon research, off-channel chum salmon habitat development, instream or off-channel fish habitat development and sediment reduction, and provisions for trout protection and production.

Proposed expenditures to accomplish the nonflow plan total $6,320,000 over the term of the license.

c. Vegetation and Wildlife

The SA emphasizes acquisition and preservation of valuable wildlife habitat in the upper Skagit River and South Fork Nooksack River valleys. SCL would purchase, own, and manage the lands according to the direction provided in the SA and the Wildlife Habitat Protection and Management Plan during the term of the new license period. SCL would attempt to acquire all wildlife lands by the end of the second license year. Parcel-specific management plans would be developed for each parcel upon the closing of purchase agreements and should be complete about a year after final closing, subject to approval of the plans by a Wildlife Management Review Committee. If SCL decided not to pursue license renewal for future license periods, it would offer to the appropriate public agencies a first right of refusal for purchase of the properties at market rates. Land parcels identified as highly desirable for purchase include the following (described in the Wildlife Habitat Protection and Management Plan [SCL 1991d]):

- an 8-mile-long riparian corridor along the South Fork of the Nooksack River (about 3,500 acres) to be managed to provide winter forage for elk;

- three parcels totaling about 500 acres just north of the riparian corridor, including Bear Lake;

- McLeod Slough parcel near the confluence of the Skagit and Sauk rivers at Rockport (about 200 acres) in a desired location near lands owned by the Washington Department of Wildlife (WDW);

- Sauk River parcel near the confluence with the Skagit River (about 171 acres) to protect heavy use by bald eagles for perching and feeding; and

- five parcels totaling roughly 875 acres along Rocky Creek, Illabot Creek, and the Skagit River near Corkindale for use by bald eagles.

Other properties may be substituted following decision by a Wildlife Land Acquisition Group established in accordance with provisions of the SA. Additional measures under the agreement include the following:

- stipulations concerning Ross Lake levels, consistent with flood control requirements;

- establishment of a wildlife management review committee;

- establishment of procedures for wildlife plan reporting and review;

- construction of a greenhouse facility;

- management of lands within the Skagit Wild and Scenic River System and of the U.S. National Park Service (NPS) lands; and

- management of conditions that could contribute to wildlife-human conflicts on SCL-owned land in the RLNRA.

Habitat management would be conducted primarily in the riparian corridor to provide winter forage for elk. Existing small clear-cuts would be maintained and some additional small blocks (less than 20 acres each) might be cleared to develop additional elk forage. Other habitat enhancement measures might include wetland restoration and improvement of wildlife habitat in power-line corridors.

Expenditures in 1990 dollars for enhancement under the SA would total $19,940,000. They are as follows:

- up to $17,000,000 for land acquisition (from $15,262,000 to $16,554,000) and habitat manipulation and enhancement (from $446,000 to $1,738,000);

- $20,000 for cultural resource reconnaissance surveys on any land to be disturbed by wildlife habitat manipulations;

- $2,920,000 for research, including a research building and equipment ($130,000), research study funding ($1,500,000 total in annual payments), long-term environmental

monitoring by the NPS in RLNRA (total of $600,000 or annual payments of $20,000), and bald eagle inventory and planning by the U.S. Forest Service (FS) (total of $90,000); and

- $600,000 for education (as annual payments of $20,000 to the North Cascades Environmental Learning Center).

d. Visual Resources

In the SA, SCL proposes to enhance the visual quality of project facilities by taking the following actions:

- fill the Ross lake reservoir as early as possible after April 15, and keep it full through Labor Day weekend, as practicable;

- paint transmission-line towers, the two surge tanks located above the Diablo and Gorge powerhouses, and the Gorge dam access road bridge "a less visually contrasting color . . . in the course of SCL's routine maintenance schedule for the project";

- redesign or modify the Ross dam Broome Gate Shed and remove the Diablo person lift within the first 10 years of the new license;

- install high-angle cut-off shielding or high-intensity sodium lamps to replace the mercury or low-intensity sodium lamps at the three project powerhouses;

- replace shiny, high-contrast or reflective galvanized or aluminum roofing and siding on project buildings in Diablo and Newhalem with more visually compatible material during routine maintenance; and

- consult with the NPS before undertaking maintenance activities that could cause important changes to the appearance of facilities in RLNRA or before constructing facilities that could be incompatible with the surrounding environment.

Actions proposed in the SA to improve the visual quality of the Diablo and Newhalem townsites include the following:

- screen views of the Diablo powerhouse and maintenance facilities by planting trees and shrubs on the side facing the North Cascades Highway;

- revegetate portions of the shoreline area around Gorge reservoir and set it aside for public use, and enhance

existing planting islands with groundcover, shrubs, and trees that are compatible with surrounding native species;

- remove three small storage buildings from the Engineering Row area in Newhalem and revegetate much of the area with native grasses, shrubs, and deciduous and coniferous trees;

- relocate SRP storage buildings in Newhalem, and develop a site for a new project greenhouse;

- pave the gravel parking lot for recreational vehicles in Newhalem and build planting islands for trees and shrubs in the parking area;

- improve the Switchyard and Ladder Creek Falls Trail parking areas in Newhalem with plantings and paving; and

- develop an overlook and information center across from the Gorge powerhouse.

To manage visual resources in and around transmission-line rights-of-way, SCL proposes the following actions in the SA:

- implement general prescriptions for managing rights-of-way, including physical actions to be taken and plant species to be allowed to grow; and

- implement specific, intensive management prescriptions for seven identified problem areas (Bacon Creek, Damnation Creek, Thornton Creek, Goodell Creek, Gorge Dam Viewpoint, Diablo "Y", and Diablo Overlook).

Proposed expenditures to accomplish these goals would total approximately $7,500,000 over the term of the license.

e. Cultural Resources

The specific agreements constituting the cultural resources part of the SA have been amended and formalized in two Memoranda of Agreement (MOAs) discussed in Section V.B.7 of this EA. In the SA, SCL proposes to undertake the following actions, in consultation with the NPS and the Washington State Historic Preservation Officer (SHPO):

Prehistoric Archaeology

- stabilize sites to lessen erosion and sedimentation damage to prehistoric sites (shoreline, forested, and drawdown);

- extract data where sites cannot be protected;

- conduct reconnaissance surveys to identify new sites;
- evaluate and test identified and new sites for National Register of Historic Places (NRHP) eligibility;
- analyze, publish, and distribute results to the scientific community of the intensive survey results and testing phases of any site excavations; and
- develop a protection and mitigation plan for all eligible and affected sites under NPS responsibility in consultation with the Nlaka'pamux Nation and the U.S. Tribes, to involve excavation, monitoring, reconnaissance, and surveying every 6 years, as well as evaluation of new sites and protection of existing (known) sites.

Historic Archaeological and Architectural Resources

- repair, expand, or refurbish 24 identified historic sites;
- supervise changes and updates to historic sites to assure consistency with the historic era;
- sponsor a continuing education or Historic Preservation Seminar Series jointly supported and funded by SCL and NPS;
- provide in-house training on the care of "contributing resources" within the historic district and focused on materials preservation, including appropriate methods of protecting, cleaning, repairing, and stabilizing historic concrete, metals, and wood;
- incorporate new material in the Skagit Tour Guide Training Manual and provide the public with an interpretive brochure that would include this new information;
- revitalize existing educational and aesthetic displays to prehistory, mining, homesteading, recreation, and natural history of the North Cascades region; and
- transfer SCL's historic photos of project construction to safety film.

Traditional Cultural Properties/Practices

- conduct inventory level studies, with the scope of work to be determined jointly with Tribes in consultation with NPS to identify cultural properties that may be affected by the SRP;

- evaluate traditional cultural properties for inclusion in the NRHP;

- evaluate traditional cultural properties for potential impacts resulting from the SRP;

- prepare a management plan identifying activities that may affect cultural properties and address ways to avoid or mitigate the effects of these activities; and

- purchase in-lieu properties to mitigate lost traditional sites and promote traditional activities.

Financial commitments to accomplish these goals include the following:

- an estimated $1,465,000 to protect archaeological resources;

- $352,000 over the license period for expenditures related to historic properties;

- $154,167 annually for 7 years to each of three intervening tribes (the Sauk Suiattle Tribe, the Swinomish Indian Tribal Community, and the Upper Skagit Tribe);

- $154,167 to each U.S. Tribe for early acquisition of TCPs ($462,501 total);

- one-third of $250,000 to each U.S. Tribe to complete TCP inventory ($250,000 total);

- $500,000 to the Nlaka'pamux Nation for Traditional Cultural Activities; and

- $100,000 to the Nlaka'pamux Nation to complete TCP inventory.

Total payments would be $1,316,669 for each U.S. tribe, totalling $3,950,008. Payments will be made to the Nlaka'pamux Nation as follows: initial payments of $154,167 made in three installments ($80,000, $20,000, and $54,167), three annual payments of $154,167, a final payment of $37,499, totalling $500,000; and an additional $100,000 to cover the completion of an ethnographic study. Therefore, payments to enhance traditional cultural properties for the Sauk Suiattle Tribe, the Swinomish Indian Tribal Community, the Upper Skagit Tribe, and the Nlaka'pamux Nation would be $4,550,008.

f. Land Use and Recreation

In the SA, SCL proposes actions to improve land use and recreation in the SRP area, including the following:

- continue to provide recreation opportunities through programs that affect recreation activities in the SRP area (e.g., tours, contributions, and services);

- replace or modify the Hozomeen boat ramp, the Ross Lake Campground boat docks, the Gorge Lake boat ramp, and the Colonial Creek boat ramp on Diablo Lake;

- remodel or replace the Newhalem visitor contact station, modify the Goodell Creek raft access site, upgrade facilities at the Damnation Creek boat-in picnic site and the Marblemount boat access site, and fund improvements to the Hozomeen water distribution system;

- provide funding for design, construction, and operation of the North Cascades Environmental Learning Center, additional facilities at the Gorge Creek and Black Peak overlook sites, handicapped access at Thunder Lake, various existing or new trails, various boat and picnic access sites, and upgrades to Skagit County's Howard Miller Steelhead Park;

- provide future funding for interpretive facilities, a bicycle facility needs assessment and funding, a recreation needs assessment and funding, SA participants coordination, and ongoing operation and maintenance costs at FS and NPS facilities within the Skagit Wild and Scenic River corridor, RLNRA, and the North Cascades Highway corridor.

Proposed expenditures to accomplish these goals would total approximately $17,000,000 over the term of the license.

4. Federal Land Management Conditions

The SRP would continue to operate on federal land under the jurisdiction of NPS's RLNRA in North Cascades National Park (NCNP) under ongoing arrangements as altered by the SA. As a signatory to the SA, the NPS intends that the SA resolves all issues related to continued operation of the SRP (SCL 1991a) for the term of the license.

B. Staff's Alternatives

The proposed SRP relicensing involves an existing project with no new construction. The environmental impacts of the proposed action (relicensing the SRP under the terms of the SA),

therefore, are the effects of operational changes that would occur if such a new license were issued. We recognize, however, that many of the terms of the SA addressed both past and continuing impacts of the SRP by proposing enhancements to the resources of the baseline environment as it exists today. For that reason, our evaluation in the following sections includes discussion of past and continuing effects as they relate to the SA.

As part of our independent analysis of the proposal, we considered other methods of enhancing the fisheries resources (the resource of most concern) and additional minor enhancements to other resources. Under this option, the license would include, in addition to the proposals in the SA, the following measures:

- pursuing alternative methods to achieve fisheries goals as detailed in Section V.B.2.b, Other Fisheries Alternatives Considered by Staff (e.g., include an instream flow requirement for the Gorge bypass reach, require alternative detailed flows and timing for redd and salmon fry protection, require alternative downramping limitations, require alternative procedures for dealing with insufficient flows, add alternative nonflow measures);

- monitoring the availability of spawning gravel by preparing occasional reports (e.g., every 10 years) that document the inflow of sediments to the lower Skagit River from tributaries (e.g., by monitoring the size of sediment accumulations at tributary mouths) and the transport of such sediments downstream (by developing a sediment rating curve to estimate bedload transport as a function of river flow rate);

- restoration of all Class I erosion sites; and

- studying the feasibility of burying or relocating sections of SRP transmission lines for each of the visually sensitive areas identified in SCL's Visual Quality Mitigation Analysis).

C. Alternative of No Action

Under the no-action alternative, the SRP would continue to operate under the terms and conditions of the existing license, and no new environmental protection or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

D. Alternatives Considered but Eliminated From Detailed Study

We considered several other alternatives to SCL's relicensing proposal but eliminated them from detailed study because they are not reasonable in the circumstances of this case. They include the following:

- federal takeover and operation of the SRP;
- issuing a nonpower license; and
- decommissioning the SRP.

We do not consider federal takeover to be a reasonable alternative. Federal takeover and operation of the SRP would require Congressional approval. While that fact alone would not preclude further consideration of this alternative, there is no evidence to indicate that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate and no federal agency has expressed an interest in operating the SRP.

Issuing a nonpower license would not provide a long-term resolution of the issues presented. A nonpower license is a temporary license which the Commission will terminate whenever it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered by the nonpower license. In this case, no agency has suggested its willingness or ability to do so. No party has sought a nonpower license, and we have no basis for concluding that the SRP should no longer be used to produce power. Thus, a nonpower license is not a realistic alternative to relicensing in these circumstances.

Project decommissioning could be accomplished with or without dam removal. Either alternative would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions. No participant has suggested that dam removal would be appropriate in this case, and we have no basis for recommending it. The reservoirs are an important recreational resource and provide benefits to certain fish and wildlife. Thus, dam removal is not a reasonable alternative to relicensing the SRP with appropriate enhancement measures.

The second decommissioning alternative would involve retaining the dam and disabling or removing equipment used to generate power. Project works would remain in place and could be used for historic or other purposes. This would require us to identify another government agency willing and able to assume regulatory control and supervision of the remaining facilities. No agency has stepped forward, and no participant has advocated

this alternative. Nor have we any basis for recommending it. Because the power supplied by the SRP is needed, a source of replacement power would have to be identified. In these circumstances, we do not consider removal of the electric generating equipment to be a reasonable alternative.

IV. CONSULTATION AND COMPLIANCE

A. Agency Consultation

The Commission's regulations require prospective applicants to consult with the appropriate resource agencies before filing an application for license. This consultation is the first step in complying with the FWCA, the Endangered Species Act, the NHPA, and other federal statutes. Prefiling consultation must be complete and documented in accordance with the Commission's regulations. The consultation record for this relicensing action dates back to the mid-1970s and is quite extensive.

In recent years, SCL has negotiated with other parties to develop settlement agreements, including the following parties:

- U.S. Department of the Interior, NPS;
- U.S. Fish and Wildlife Service (FWS);
- U.S. Bureau of Indian Affairs;
- U.S. Department of Agriculture, FS;
- U.S. Department of Commerce, National Marine Fisheries Service (NMFS);
- the Upper Skagit Tribe, the Sauk-Suiattle Tribe, the Swinomish Indian Tribal Community, and the Nlaka'pamux Nation (Tribes);
- Washington Department of Fisheries (WDF);
- Washington Department of Wildlife (WDW); and
- North Cascades Conservation Council.

Consultation and negotiation with the above-mentioned parties resulted in the SA in April, 1991, with additional specific agreements in 1993. The SA included specific settlement agreements in the following areas:

- fisheries (SCL 1991b);
- wildlife (SCL 1991c);

- erosion control (SCL 1991f);
- cultural (archaeological and historic) resources (SCL 1993a, 1991n);
- recreation and aesthetics (SCL 1991i); and
- traditional cultural properties (SCL 1993b, 1991k, l, m).

The provisions of these are summarized in Section III.A.3.

With the exception of SCL, all of the parties to the SA listed above intervened in the relicensing procedure. The SA addresses their concerns. Intervenors (and date the motion for intervenor status was filed) are as follows:

- the Nlaka'pamux National Tribal Council (November 7, 1990 with notice granting late intervention on June 27, 1991);
- the Swinomish Tribal Community, the Upper Skagit Tribe and the Sauk-Suiattle Tribe (March 7, 1979 with notice granting intervention on May 15, 1979);
- the NMFS (March 8, 1979);
- the Washington State Department of Game (February 7, 1979);
- the North Cascades Conservation Council (March 12, 1979 with notice granting intervention on May 8, 1979);
- the Washington State Department of Fisheries (February 7, 1979);
- the Secretary of the Interior (March 9, 1979);
- the Washington State Department of Ecology (WDOE) (March 9, 1979); and
- the U.S. Department of Agriculture (April 18, 1979 with notice granting intervention on May 8, 1979).

On January 2, 1991, the Commission issued a notice of intent to prepare a cumulative EA and conduct scoping meetings related to proposed hydropower projects in the Skagit River Basin. The SRP was 1 of 11 license applications evaluated in this process, which considered the comments of numerous organizations and individuals (Commission 1991). The scoping meetings for the cumulative EA, held in January 1991, were attended by representatives of the parties to the SA as outlined above as well as by members of the public. No objections were raised during the scoping process to relicensing the SRP; moreover, oral

and written comments submitted by the parties to the then forthcoming SA were uniformly in favor of relicensing under the terms of the SA.

B. Comments on the Draft EA

The following respondents commented on the draft EA:

- Seattle City Light (dated April 19, 1994)
- U.S. Department of Interior (dated April 19, 1994)
- U.S. Army, Corps of Engineers (dated April 19, 1994)
- North Cascades Conservation Council (dated April 15, 1994)
- Mandell Pinder for the Nlaka'pamux Nation (dated April 26, 1994)
- National Marine Fisheries Service (dated April 14, 1994)
- Evergreen Legal Services for the Skagit River Tribes (dated April 14, 1994)
- North Cascades Institute (dated April 15, 1994)
- U.S. Fish and Wildlife Service (dated April 19, 1994)

C. Water Quality Certification

By letter dated April 8, 1977, the WDOE acknowledged that the SRP caused no adverse downstream water quality effects and that water quality was high. By letter dated June 29, 1977, SCL requested a Certificate of Water Quality from the WDOE under Section 401 of the Clean Water Act. Because WDOE did not act on the request within 1 year, the certificate is deemed waived pursuant to Section 4.38 (f)(7)(ii) of the Commission's regulations.

By letter dated December 13, 1991, WDOE expressly waived certification under Section 401(a)(1) of the Clean Water Act. WDOE added that it supports the water quality conditions included in the SA.

D. Washington Coastal Management Program

Because the SRP is located in a coastal zone and may affect coastal resources, WDOE must review the proposed project for consistency with the state's Coastal Management Program (CMP). Under the Coastal Zone Management Act of 1972, before a license can be issued, WDOE must either: (1) find the project consistent

with the CMP or (2) waive the requirements by failing to act in a timely manner.

By letter dated January 7, 1994, the Commission requested SCL to consult with WDOE and supply WDOE and the Commission with a certification of consistency with the CMP. The WDOE responded to SCL with a concurrence letter dated February 15, 1994. SCL forwarded WDOE's concurrence letter to the Commission in a letter dated February 23, 1994.

Coastal resources that may be affected by hydroelectric development in Washington include anadromous fish, water quality, and sediment. In this EA, the expected impacts from the proposed relicensing are quantified. Because the current operation of the SRP would not change, no new impacts would occur. Continued flow fluctuations from SRP operations would have a minor effect on anadromous fish. Based on our analysis, the project would not have a significant impact on coastal resources.

V. ENVIRONMENTAL ANALYSIS

A. General Description of the Locale

1. Skagit River Basin

The Skagit River drainage basin, the largest in the Puget Sound area, encompasses 3,105 square miles on the western slope of the Cascade Mountains in northwestern Washington and southwestern Canada. The eastern part of the basin consists of heavily forested, extremely rugged, mountainous terrain. About 70 percent of the basin falls under federal administration, including 550 square miles designated as U.S. Forest Service wilderness, 750 square miles of national park, 170 square miles of national recreation area, and about 60 square miles in the National Wild and Scenic Rivers Systems.

The Skagit River originates in British Columbia and flows southwest for more than 120 miles to Skagit Bay and Rosario Strait in Puget Sound. The Skagit River divides into two distributaries (outlet channels) in the delta, the North Fork and South Fork, about 10 miles above the mouth. Major tributaries (the Cascade, Sauk, and Baker rivers) join the Skagit River at the towns of Marblemount, Rockport, and Concrete, respectively (figure 1). The average annual discharge of the Skagit River near Mount Vernon is about 16,700 cubic feet per second (cfs).

The Skagit River enters Ross reservoir within Canada. Ross reservoir is the largest reservoir in the Skagit River Basin. Ross dam and powerhouse discharge into Diablo reservoir. Immediately below Diablo dam is the small Gorge reservoir. Downstream of Gorge dam near Newhalem, Washington [river mile

(RM) 96.6], the river flows through the Skagit River Valley and discharges into Puget Sound through two distributaries. The SRP is located within the RLNRA of NCNP (figure 2), which in turn is bounded by lands of Mount Baker-Snoqualmie National Forest.

2. Cumulative Impacts

The Commission recognizes the importance of considering both site-specific and cumulative impacts of hydropower developments in making licensing decisions. The Council on Environmental Quality defines cumulative impacts as the incremental impacts of an action on the environment added to other past, present, and reasonably foreseeable future actions taken by any agency or person (40 CFR 1508.7). Cumulative impacts can be additive or interactive effects from multiple developments in a defined geographic area (in this case, the Skagit River Basin) and can result from individually minor but collectively significant actions taking place over time. The existing environment shows the effects of past and present actions and provides a context for determining the cumulative impacts of future actions.

The SRP is one of six licensed hydropower projects in the Skagit River basin (table 2). The Baker River Project consists of two dams and reservoirs (Lower Baker dam/Lake Shannon and Upper Baker dam/Baker Lake) on the lower reaches of the Baker River (figure 1). The remaining four projects are small hydropower projects on tributaries to the Baker or Skagit rivers with small water diversions to power houses near the valley floor but with no impoundments.

Nine license applications are outstanding for additional small hydropower projects on tributaries to the Skagit River (table 3). These projects are being evaluated by the Commission in a separate environmental impact statement. Development and operation of none of these projects are assured.

The Commission has previously conducted an analysis of potential cumulative impacts of proposed hydropower developments in the Skagit River Basin (Commission 1991). To conduct the analysis, we identified four important resources in a scoping process: anadromous fish, sensitive terrestrial ecological resources, recreational and visual resources, and cultural resources. The analysis also included consideration of how these resources could be affected by slope stability and material transport. The analysis was documented in an EA prepared by the Commission in November 1991 (Commission 1991). In the EA, we found that the SRP does "... not appear to have the potential to contribute to cumulative adverse impacts on any of the target resources." In this EA we reviewed the findings of Commission (1991) and concluded that relicensing the project would have no adverse cumulative impacts and in some cases would have beneficial effects on resources in the basin. Our conclusions

Table 2. Licensed projects in the Skagit River Basin, as of November 1993. (Source: The staff.)

Project no.	Project name	Water body
553	Skagit River	Skagit River
2150	Baker River	Baker River
2705	Newhalem Creek	Newhalem Creek
3239	Koma Kulshan	Rocky Creek and Sulphur Creek
10141	Olson Creek	Olson Creek
10371	Bear Creek	Bear Creek

Licensed and pending licensed hydropower projects in the Skagit River Basin are shown in tables 2 and 3.

Table 3. Pending license applications in the Skagit River Basin as of November 1993. (Source: The staff.)

Project no.	Project name	Water body
3913	Thunder Creek	Thunder Creek
4376	Rocky Creek	Rocky Creek
4437	Diobsud Creek	Diobsud Creek
6984	Boulder Creek	Boulder Creek
9787	Jordan Creek	Jordan Creek
10100	Irene Creek	Irene Creek
10269	Jackman Creek	Jackman Creek
10311	Rocky Creek	Rocky Creek
10416	Anderson Creek	Anderson Creek and Four Mile Creek

for the various resources are discussed in appropriate parts of Section V.

B. Proposed Project

1. Geology and Soils

Affected Environment (Geology and Soils)

Bedrock in the SRP vicinity consists of highly deformed metamorphic, igneous, and sedimentary rock with numerous faults and fractures. Tabor et al. (1989), Miller and Bowering (1990), and Haugerud et al. (1991) described recent interpretations of the Late Cretaceous-age deformational history of the area's rock units. Locations of highly deformed or shattered bedrock are often associated with deeply weathered rock and thick soils. The most extensive rock type in the area is the Skagit Gneiss (Misch 1966) or Skagit Gneiss Complex (Haugerud et al. 1991).

Glaciation in the Pleistocene resulted in erosional scouring and deposition of a variety of glacially-related, fine-grained to boulder-sized soils in the Skagit River Basin. Glaciation also produced the steep, rugged mountains and low river valleys that are characteristic of the topography of the North Cascades. Slopes commonly range from 30 to 60 percent, reaching as high as 90 percent locally; vertical cliffs also occur in river gorges. Glacial deposits and colluvium (soils formed in-place and transported downslope by gravity) form the bulk of the surficial soils in the region. Soils in the SRP area have not been mapped in detail, although landform and surficial geology maps have been prepared (Riedel 1990).

The three reservoirs that comprise the SRP cover approximately 12,400 acres of the Skagit River Basin. Ross, Diablo, and Gorge reservoirs have 54.5, 14.6, and 8.8 miles of shoreline at full pool, respectively. The generally thick, unconsolidated glacial till, alluvium, and outwash deposits historically have been and remain subject to erosion from waves, currents, freeze-thaw, mass movements, groundwater discharge, and overland flow processes.

Environmental Impacts and Recommendations (Geology and Soils)

In a detailed study of SRP-related erosion, Riedel (1990) reported 25 percent of Ross Lake shoreline (approximately 14.4 miles), 10 percent of Diablo Lake shoreline (approximately 1.5 miles), and 2 percent of Gorge Lake shoreline (approximately 0.18 miles) to be in various stages of erosion-related retreat. In the case of Ross Lake, 1.7 acres/year are estimated to be lost to shoreline erosion each year. Riedel (1990) reported 1,143 erosion sites on Ross Lake, 78 on Diablo Lake, and 17 on Gorge Lake. Class I sites (areas where mass movements > 1,000 ft3 have occurred or could occur) accounted for 3 percent of all erosion sites on Ross Lake, 6 percent on Diablo Lake, and 18 percent on Gorge Lake. Class II and III sites (those where mass movements

< 1,000 ft3 have occurred or could occur and with eroding bluff faces > 3 5 ft and < 3 5 ft, respectively) account for the vast majority of eroding areas on all reservoirs.

Reservoir pool elevations control wave impact and shoreline erosion (Reid 1984). Cyclic reservoir drawdown promotes further erosion by preventing the development of stable shorelines (Lawson 1985). Riedel (1990) noted immature shoreline profiles in all three SRP reservoirs, probably related to fluctuating pool elevations.

Riedel (1990) inventoried and categorized erosion areas to develop erosion control measures under the proposed action. Along with fluctuating pool elevations and elevations above full pool, wave action and mass movements were the dominant shoreline erosion mechanisms on the SRP reservoirs. Other processes, such as freeze/thaw and recreational use, contributed less to erosion. On Diablo and Gorge lakes, smaller pool elevation fluctuations and more shoreline bedrock resulted in less overall erosion than on Ross Lake.

For the Skagit River below the SRP area, water-discharge variations from Gorge powerhouse during periods of peak electricity demand result in 1- to 2-ft water-level fluctuations at Marblemount. Evidence indicates that changes in Skagit River channel position, channel shape, and bed elevation below the SRP area have been minor since the mid-1950s, which suggests that impacts on spawning areas from the SRP have been minor. Nonetheless, spawning could still be adversely affected by loss of gravel recruitment and armoring and coarsening of the river bed.

A summary of enhancement plans under the SA is provided in Section III.A.3. Relicensing the SRP as proposed would not change the blockage of downstream sediment transport. Sediments carried into the SRP's reservoirs from upstream would continue to be trapped in the reservoirs. The current conditions of plentiful spawning gravel and possible aggradation of the channel would be expected to continue under all alternatives considered.

Along project-related roads, the comparatively minor erosion stems largely from interruption of the course of small streams and from small areas of mass movement. Along transmission-corridor access roads, which comprise the bulk of project roads, no major erosion problems exist.

Sedimentation in the SRP reservoirs is greatest at the mouths of tributary valleys, particularly those that drain glaciers. Thunder Arm, at the mouth of Thunder Creek in Diablo Lake, is filling with sediment; it was dredged by the NPS in 1987. Deposition into Diablo Lake will continue indefinitely, requiring continued dredging.

SCL prepared an erosion control plan (SCL 1991e) that provides the basis for terms of the settlement agreement on erosion control between the SCL and the NPS (SCL 1991f). This part of the SA describes locations where active erosion control measures will be undertaken during the first 9 years of the license period and describes locations where erosion monitoring would be performed for potential future action.

Thirty-seven reservoir shoreline sites (out of 1,238 identified) and 18 road sites (all that have been identified) were selected for priority erosion control measures. "The primary criterion used to select sites for erosion control assessment was potential effects on recreational resources" (SCL 1991e). Active erosion control measures on shorelines include placing control structures and vegetation to halt or greatly reduce erosion. These measures would help maintain the natural and wilderness conditions of the SRP area. Passive measures include monitoring the erosion processes and rates. In addition, erosion control measures will be undertaken at other sites identified during the license period. No erosion control measures are planned for the Skagit River below the SRP area.

We consider that shoreline and road erosion are baseline conditions that will continue to degrade during the new license term unless addressed. The operation of the reservoirs under the proposed action would result in some additional degradation of the reservoir shoreline. Implementing the erosion control measures as described in the SA would treat only 2 percent of all identified sites exhibiting shoreline erosion and 5 percent of Class I sites (sites with most severe erosion) described in the erosion control plan. However, it would be impractical to prevent erosion along all eroding shorelines, and the erosion control measures as described in the SA address shoreline sites where erosion control would be of most value. These sites include campgrounds and trails, project facilities, and areas known to contain sensitive or rare habitat or species. In addition, the SA provides for erosion control work at new sites identified during the license period. Thus, any additional degradation would not significantly increase adverse effects on important resources. The land area affected by additional erosion would be small relative to the entire shoreline area, where most erosion would occur. We therefore consider that implementing additional measures to prevent degradation of the shoreline is unnecessary.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that pipeline rupture and material transport were important concerns with regard to cumulative impacts. The only pipelines associated with the SRP are short conveyances from Diablo reservoir to its power house (Section III.A.b). These structures have functioned safely for many years, and with continued maintenance, the pipeline should be

safe and adequate for continued use and operation. Because relicensing the SRP is unlikely to involve pipeline rupture or changes in material transport, we conclude that the proposed action would not have significant cumulative impacts on geology and soils.

Unavoidable Adverse Impacts (Geology and Soils)

SRP relicensing would result in the continued blocking of sediment delivery to the Skagit River downstream of the SRP area. Cyclic reservoir drawdown that promotes shoreline erosion and sedimentation at the mouths of tributaries would be lessened but not eliminated by the proposed action.

2. Water and Fishery Resources

a. Water Resources

Affected Environment (Water Resources)

The average discharge of the Skagit River from its 1,175-square-mile watershed at Newhalem, just downstream of the SRP, is approximately 4,500 cfs based on historical flow records. Flow- duration curves for natural inflows at Ross, Diablo, and Gorge reservoirs for the period 1928 1968 show wide ranges of flows, from less than 500 cfs to over 18,000 cfs (SCL 1977; figure 3). Median flows below Gorge dam are about 3,200 cfs. A license amendment issued in 1968 required a minimum flow release of 1,000 cfs from Gorge dam; however, flows fluctuate according to electricity demand. For example, flows at Newhalem varied from 1,550 to 7,000 cfs on a daily cycle between March 21 and March 30, 1985 (Beck and Associates 1987; figure 4). Since 1978, interim flow agreements between SCL and the state and federal resource agencies have moderated flow fluctuations and altered timing of releases for benefit of fish downstream of the SRP. Major floods occur (e.g., in November 1990) when warm "chinook" winds and rain fall on snowpack. Although Ross reservoir has 120,000 acre-feet of flood control storage, an agreement with the Corps of Engineers limits most flood control operations to the period from October 1 to March 15 (induced surcharge storage up to 95,000 acre-feet may be used at any time to minimize flood damage).

Historically, water quality in the Skagit River Basin was excellent and remains generally so. Most tributary streams are rated exceptional (Class AA) by the WDOE. The mainstem Skagit River becomes progressively more turbid as one goes downstream. A major source of turbidity is the Sauk River (about RM 66). During heavy rainfall and during rain-on-snow events, smaller tributaries that have been logged heavily become turbid and may have large debris flows; these effects were less evident historically before heavy logging in the basin. Most of the

See graph on page 31 of the hard copy.

Figure 3. Flow duration curves for natural flow in the Skagit River at Ross, Diablo, and Gorge reservoirs, 1928 1968. Data for monthly flows in 100 cfs increments. (Adapted by staff from SCL 1977).

See graph on page 32 of the hard copy.

Figure 4. Discharge versus time hydrograph of the Skagit River at Newhalem, March 21 to March 30, 1985. (Adapted by staff from R. W. Beck and Associates 1987).

watershed upstream of the SRP is in National Park or National Recreation areas, and is not logged, so water quality remains higher than downstream reaches and other tributaries, even in flood events. There have been significant natural debris flows on some streams in the RLNRA.

The only water rights in the SRP are those retained by SCL for operation of the SRP. These rights are listed in the application for relicense. Because operation of the SRP requires no consumptive use and there is no proposed change in project operation, relicensing the SRP would not affect any existing water rights.

Environmental Impacts and Recommendations (Water Resources)

Sedimentation

As discussed in Section V.B.1, the SRP blocks movement of sediments downstream from the upper basin. Sediments are deposited in the reservoirs and will accumulate there, progressively decreasing storage capacity. Only fine sediment (turbidity) is released below Gorge dam. In many river systems, this situation could cause depletion of spawning gravels for fish downstream. The Skagit River, however, has an exceptionally high load of sediment from numerous side tributaries draining the rapidly eroding Cascade Mountains and is not sediment-limited for fish below the SRP (Commission 1991). SCL has used appropriate erosion control procedures on the existing project and included erosion control measures as part of the SA to minimize additional erosion-related turbidity that could affect downstream fish populations (Section III.B.1). When properly implemented, these erosion control measures should be sufficient to protect aquatic resources from siltation from the existing project.

Gas Supersaturation

Based on more than a decade of tailwater fish studies (Graybill et al. 1979; Crumley and Stober 1984; Beck and Associates 1987), gas supersaturation and related fish damages, which may occur at some hydropower facilities, appear to be only a minor problem at the SRP. The concentrations of gases dissolved in water are usually at equilibrium with the atmosphere, but if air is entrained into the intake structure (e.g., by surface vortices) or if the discharge falls into a deep plunge pool, excessive amounts of gases can be dissolved that can injure fish (Wolke et al. 1975). Fish mortalities generally occur when gas saturation values exceed 110 to 115 percent (EPA 1986). There have been no reported problems with gas supersaturation at the SRP facilities during a decade of intensive biological studies, and our analysis of the intakes and discharges does not reveal a susceptibility to air entrainment.

Temperature

Regulation of flow by impoundments in a river system always affects river temperatures. Water storage provides a time lag whereby cooler water is released in summer and warmer water is released in winter before impoundment. Because the proposed SA would slightly alter the filling and release schedules from historical release regimes, water temperatures will also be slightly different. However, because the thermal regime of the river has already been set by interim and voluntary flow agreements that have been in place for several years, temperature changes would not be significantly affected by the requirements imposed in the SA.

Other Water Quality Concerns

Electricity generating facilities that are operated for a long time are likely to have electrical equipment containing polychlorinated biphenyls (PCBs) that are known to be accumulated by aquatic life which then become unhealthful for human consumption. There are adequate federal and state regulations governing PCBs with which SCL must comply to minimize spread of PCB-contaminated materials to the Skagit River. SCL has implemented a PCB management program for the project area. The erosion control plan of the SA is germane to minimization of PCBs in erodible materials. General disposition of petroleum products as wastes or leakage from equipment is a general concern. With adequate supervision and compliance monitoring, we do not anticipate water quality problems from the SRP facilities.

Cumulative Impacts

The effects of the existing project on water quality are minor, as shown above. Relicensing the SRP under the SA would not change these effects, and some additional beneficial effects would result. Thus we conclude that significant cumulative impacts would not occur.

Unavoidable Adverse Impacts (Water Resources)

Water management of the Skagit River under the terms of the SA would be no different from operation under interim agreements now in effect; hence, water quality would be no worse than at present. Sediment flow to the Skagit River below Gorge dam will continue to be altered by reservoir interception of all but the finest particles, but the lost sediment load is more than augmented by tributary sources. A fluctuating flow regime will persist below Gorge powerhouse, but it will be regulated to minimize most adverse effects on fish (see below)..

b. Fishery Resources

Affected Environment (Fishery Resources)

Historically, the upper reach of the Skagit River was not important for anadromous fishes but had abundant resident rainbow trout, cutthroat trout, and Dolly Varden. Bull trout, recently recognized as a separate char species, may also have been present in this area. Dam construction for the SRP markedly expanded habitat for resident species in the newly created reservoirs, especially rainbow trout. Flowing water habitat for species that required it (e.g., native char species) was reduced. There were also major detrimental effects of the SRP on anadromous fish resources downstream of Gorge dam caused by rapid and large fluctuations in water level.

Historical information indicates that, under preproject conditions, the narrow canyon, high falls and extremely turbulent rapids in the Gorge reach of the river above Newhalem prevented anadromous fish from migrating much above the current locations of Gorge and Diablo dams (Brueggeman et al. 1988). The upper limit of anadromous fish migration on the Skagit River probably included the vicinity of the Reflector Bar and Cedar Bar on the mainstem Skagit River and Stetattle Creek, all located upstream of Gorge dam and downstream of Diablo dam. A small number of chinook salmon returned to the Gorge powerhouse area in the most favorable years. Resident trout were probably abundant in the upper Skagit River Basin wherever accessible habitat was available (Brueggeman et al. 1988).

Initially, the SRP had severe effects on anadromous fish resources from the time of reservoir filling through the early 1980s (Brueggeman et al. 1988). Flow fluctuations caused by varying the amount of water passing through turbines severely reduced usable habitat for fish spawning and production of fish food organisms. Young salmon, trout, and resident fish were stranded in shoreline areas and potholes (natural depressions in the river bottom). At very low flows, adult salmon and trout were unable to find sufficiently deep water to pass the gravel deltas that accumulated at mouths of tributaries.

In 1978, the Commission instituted a separate proceeding (Docket No. EL 78-36) to address the effects of the project's flow regime on the Skagit River fisheries resources. Negotiations between the SCL, state, federal, and tribal resource agencies produced a series of interim flow agreements and biological studies to clarify and rectify the continuing damages to anadromous fish. Resident fish population levels, particularly in Ross Lake, exceed predicted pre-project riverine populations (Brueggeman 1988). This is due principally to increases in habitat area created within the reservoirs. The catchable trout populations in Ross Lake, based on 1970's and

1990's hydroacoustic surveys, have varied from 20,000 to 37,082 fish (Looff 1993).

Fish Habitats

There are four major habitats for fish in and downstream of the existing SRP that would be affected by relicensing, as indicated in the following list.

- Ross Lake. Ross Lake is used for resident fish production and recreational fisheries as well as for human contact and noncontact water uses (also see Recreation, Section V.B.8). The lake is not accessible to anadromous salmon or steelhead but contains resident rainbow trout, which are a self-sustaining, native population and a viable recreational resource. There are also cutthroat trout and Dolly Varden. Water withdrawals from Ross Lake for hydropower and instream flow for downstream fisheries require water that is also important for in-lake uses. The filling schedule in spring and summer and the duration of full pool in summer are critical elements that can affect fisheries resources and their uses. The reservoir normally fills in late spring (April June), is maintained at high levels in early summer, and is gradually lowered in late summer and early autumn, depending on the amount of runoff. Resident fish production within tributary reaches that traverse the drawdown zone can be affected by the spring and early summer (April-June) refill of Ross reservoir. The primary effects are inundation of redds and the creation of transitory barriers within the stream channels of the drawdown zone. These transitory barriers (fish migration barriers created by reservoir operations) will be removed by SCL on an annual basis before the annual trout migration period.

- Ross dam to Gorge dam. This reach includes alternating riverine tailwater and narrow, deep reservoir habitat, all of which are populated by resident fish species, principally rainbow trout. There are also cutthroat trout, native char (that may be Dolly Varden or bull trout), and small numbers of eastern brook trout. Fish habitats change over short distances: Ross Lake tailwaters (about 1.5 miles long), Diablo Lake (about 2 miles long), a short reach of river between Diablo dam and Diablo powerhouse (about 1 mile long), and Gorge Lake (about 3 miles long). Diablo reservoir serves mainly as a flow reregulating reservoir for the daily and weekly fluctuating flows from Ross dam. The Ross tailwater exhibits large fluctuating flows, and Diablo reservoir has rapidly changing elevation. The Skagit River between Diablo dam and Diablo powerhouse can be dewatered when Gorge Lake is not at full pool; Gorge Lake reaches the

base of Diablo Dam at full pool. Because angler access is limited or not possible, the resident fish resources of this entire reach are less important recreationally than the anadromous fish resources downstream of the SRP, where most management attention has been devoted. Catchable trout in Gorge Lake were estimated to number 3,398 (Brueggeman, et al. 1988.)

- Gorge bypassed reach. An approximately 2.7-mile-long bypassed reach of the Skagit River between Gorge dam and Gorge powerhouse (figure 1) is partially dewatered by diversion of hydropower flows through conduits to the Gorge powerhouse. Depending on available river flow, this reach can be dewatered. It is not used by anglers. This reach is contiguous with the lower mainstem Skagit River and could otherwise host anadromous salmon and steelhead, as well as resident species. The Gorge bypass reach is fairly well populated with resident fish, and with anadromous species at the downstream end. The habitat quality is good at fairly low flows. Habitat quality in much of the bypass reach becomes marginal at normal Skagit River flows due to severe cascades and rapids.

- Mainstem Skagit River downstream of Gorge powerhouse. This reach of river, from the Gorge powerhouse to Puget Sound, is used extensively by anadromous salmon and steelhead and is currently affected by the SRP principally by the fluctuating flows generated at the Gorge powerhouse. The present flow regime is a product of negotiations and interim agreements between SCL and the resource agencies since the mid-1970s. Each species of salmon and trout present in the river reach can be affected by the project-generated flow regime, regardless of life stage or residence time (i.e., continually or at only certain times of the year).

Aspects of the existing flow regime in the mainstem Skagit River below Gorge powerhouse that are important to maintaining anadromous fish habitats include the following:

- instantaneous minimum flows that, if too low, can prevent adult salmon spawning in autumn and steelhead spawning in spring, dewater existing redds constructed at higher flows, and reduce juvenile rearing habitat;

- downramping rates that, if too high at certain times of the year and day, can strand juvenile salmon and steelhead in shallows;

- maximum average daily flows during spawning periods that, if too high, can cause adults to create redds at high

elevations that later would be dewatered when flows are reduced;

- daily flow amplitude that, when too great, can create unstable conditions for all fish resources;

- water temperatures, which must be maintained at the proper level for adult migrations, winter and spring incubation of salmon and steelhead eggs, and rearing of juveniles throughout the year (Beck and Associates 1987);

- flooding that maintains side-channel habitat important to rearing and spawning; and .

- woody debris that is passed downstream.

Flows in the lower Skagit River cannot be completely controlled by the SRP for the benefit of fish habitat. Despite water regulation from Ross Lake, water flow in the basin is sometimes less than that desired by resource agencies for salmon and trout below Gorge powerhouse. Circumstances also arise in which SCL cannot react to or control flows and other operational factors that could affect fish and their habitats, such as generator outages, emergency conditions, uncontrollable high flows, flood control measures by the Corps of Engineers, and high or low sidestream inflows.

Fish Species

The Skagit River downstream of Gorge dam receives runs of all five species of Pacific salmon (chinook, coho, pink, chum, and sockeye) and three other anadromous game species (steelhead, sea-run cutthroat trout, and sea-run Dolly Varden) (Williams et al. 1975; WDF Information System). Some of these runs extend upstream to the zone below the SRP, whereas other runs occupy the lower Skagit River and migrate to and from tributary streams. The Skagit system is one of the few Puget Sound watersheds in which salmon are managed on a natural-stock basis, although there is some hatchery contribution especially for coho salmon (Commission 1991). Statistics on commercial catches and spawning escapements of the three principal salmon species summer/fall chinook, coho, and pink are provided annually by the Pacific Fishery Management Council (figure 5). Run sizes are cyclical and are currently low for coho. Improved river flow management over the last 12 years correlates positively with increased production of pink and chum salmon. The river and reservoirs above Gorge dam contain resident species, principally native rainbow trout but also cutthroat and brook trout and Dolly Varden char.

See graph on page 39 of the hard copy.

Figure 5. Puget Sound commercial net fishery catches and spawning escapements of Skagit River chinook, coho, and pink salmon (numbers of fish for hatchery and natural stocks) (Source: Adapted by Staff from PFMC 1993.)

Environmental Impacts and Recommendations (Fishery Resources)

Continuing effects of the SRP on fisheries resources are (1) impacts to resident fishes, particularly rainbow trout, in lakes where shoreline and tributary spawning are affected by fluctuating elevations due to schedules of water storage and release; (2) impacts to resident fishes, principally rainbow trout, in two stream reaches between Ross dam and Gorge powerhouse where some habitat is eliminated by reduced flows because of bypassing water to turbines; (3) impacts to resident fish and anadromous salmon and steelhead trout in the Skagit River from Gorge dam to Gorge powerhouse where some habitat is eliminated by reduced flows because of bypassing water to the Gorge powerhouse turbines; and (4) impacts to resident fish and anadromous salmon and steelhead trout in the Skagit River from Gorge powerhouse to Puget Sound where suitable habitat for all life stages can be affected by fluctuating flows from Gorge powerhouse.

The proposed action addresses each of these fishery issues with existing operational measures, enhancements, or both. A summary of the plans in the SA is provided in Section III.A.3. The proposed operational measures are identical to the current operating regime under interim agreements (Appendix A herein). These interim agreements are the original 1981 Interim Agreement and the Fish Flow Plan from the fisheries SA. SCL agreed (written letter agreement in 1991) with the agencies and Tribes to implement the Fish Flow Plan of the SA voluntarily until the Commission issues a new license. The Interim Agreement approved by the Commission in 1981 is less comprehensive and is indexed differently than the proposed Flow Plan. Currently, SCL voluntarily implements the measures proposed in the Flow Plan to the extent that they do not conflict with the Interim Agreement of 1981. The SA Flow Plan is intended to replace the Interim Agreement of 1981, formalize its implementation, and further improve fish habitat conditions. Thus, effects on fish from the proposed operating regime are virtually identical to existing current practice (the no-action alternative). Some effects on the fishery resources remain under the current operating regime, such as the dewatering of the Skagit River between Gorge dam and the Gorge powerhouse at low flows (in which fish kills and habitat loss can occur as agreed-upon flows change with season, river flow, and project operation). The proposed non-flow actions under the fisheries agreement of the SA address these anticipated recurring losses (Section III.A.3). The SA also addresses some general effects on the fishery resources from habitat modifications below the SRP with proposed habitat enhancements (e.g., rearing salmonids) elsewhere in the basin.

We have evaluated and summarized the fisheries-related operations and enhancements of the SA, found them to be related to a project purpose based on the facts presented, and have

assigned each action a category based on our understanding of the issues.

Lake Fish

To address the loss of spawning habitat in Ross Lake or its tributaries because of lake level changes, a filling schedule that has been successful under the interim agreements is proposed in the SA for continuation. This schedule calls for SCL to fill Ross Lake as early and as full as possible after April 15 (to achieve full pool by July 31 each year) and to hold pool level at or close to full through Labor Day weekend. The filling schedule is contingent upon adequate runoff, meeting anadromous fisheries protection flows below the reservoir, flood protection, minimized spill, and firm power generation needs.

Lake level and the timing of water level fluctuations are known to affect the success of spawning of reservoir fishes, including fish that spawn along shorelines and those that must ascend tributaries (Hall 1971). Under a contract with SCL, the University of Washington Fisheries Research Institute studied the Ross reservoir fishery intensively in the early 1970s. At that time, raising the elevation of the Ross pool an additional 122.5 feet was contemplated. These studies identified the principal tributaries used for spawning, and concluded that about 50 miles of stream length were available for rainbow trout in British Columbia and Washington. Because rising lake levels inundate spawning sites in the tributaries used by rainbow trout in mid-May through mid-July, the researchers recommended that as much filling as possible be accomplished before extensive spawning begins. Spawning by Dolly Varden and brook trout are unaffected by the normal reservoir schedule, because spawning occurs in tributary streams during autumn, when reservoir levels are declining. The institute's researchers found cutthroat trout spawning only in areas unaffected by the reservoir fluctuations. Based on review of these studies, we concur that the proposed filling schedule for Ross Reservoir is related to the purpose of the project (stored water to supply hydropower) and impacts project relicensing because of the need to protect fish spawning habitat in the reservoir and its tributaries.

There are also several other programs in the SA to support resident trout protection and production (table 4). To facilitate spawning of resident rainbow trout in tributary drawdown zones of Ross Lake and in tributaries to Diablo and Gorge reservoirs, SCL is to survey for and remove transitory barriers to spawning migrations. Such barriers include drift logs, drift boom logs, and accumulations of sediment or debris caused by project operations between the minimum and maximum reservoir elevations. This action should improve access to the existing spawning habitat in support of trout reproduction. We consider these activities to be related to the purpose of the

Table 4. Summary of the anadromous and resident fish nonflow plan from the Fisheries Agreement of the Offer of Settlement. (Source: SCL 1991b.)

Program	Dollar Allocation1	License Years	Program Manager(s)	Comments
ANADROMOUS FISH PROGRAM				
Steelhead smolt production			WDW and/or SSC and/or WDF	
Engineering	175,000	1 2		
Capital improvements/ construction	1,250,000	3 5		
Operation and maintenance	1,275,000	6 30		
O&M based on maximum of $51,000 per year				
Subtotal	2,700,000	1 30		
Chinook research			WDF	
Startup, tagging, rearing	250,000	1 4		
Rearing, tagging, recovery	450,000	5 7		
Maximum of $150,000/year				
Recovery, evaluation	600,000	8 13		
Maximum of $100,000/year				
Subtotal	1,300,000	1 13		
Chum habitat			WDF/SSC	
Site inventory, evaluation, ranking, habitat development, maintenance	50,000	1	Max	
$150,000/year till funds exhausted				
Subtotal	1,500,000	1 30		
County Line and Newhalem ponds			WDF	
City to repay WDF for development. If funds left over, used for O&M.				
Subtotal	220,000			
Instream & off-channel habitat	150,000	1 4	FS	
Improvement and sediment reduction	150,000	5 30		
Subtotal	300,000	1 30		
Anadromous fish program total	6,020,000			
RESIDENT TROUT PROTECTION AND PRODUCTION PROGRAM				
Ross tributary transitory barrier removal	see comments	1 30		
SCL SCL performs each year as necessary				
Diablo and Gorge fisheries	300,000	1 30		
WDW/NPS Additional funds may be drawn from Steelhead Smolt				
Resident trout program total	300,000	1 30		
Total does not include SCL barrier removal costs or money reallocated from Steelhead Smolt Production				
Nonflow plan total	6,320,000	1 30		
Program				

1/ Amounts in 1990 dollars.

project and worthwhile approaches for effects directly attributable to reservoir operations. Using captive native broodstock, a trout supplementation program would be established for the Skagit River and its tributaries above Gorge dam with special emphasis on Gorge and Diablo reservoirs. This area has little spawning habitat now because of project operations, and supplementation is an appropriate enhancement. The goal would be to produce 400,000 fingerlings each year at existing WDFW facilities wherever they are available. We conclude that reasonable measures have been proposed to protect and enhance the resident trout populations in lakes affected by project operations, and that no additional measures are warranted.

Diablo Bypassed Reach Fishes

To address the loss of habitat for resident fishes in the short bypassed reach below Diablo dam, the proposed action would enhance the trout resource by stocking Diablo and Gorge reservoirs (Table 4). The bypassed reach is short (< 1 mile), and offers only a small amount of habitat for resident fishes. The more productive habitat for resident trout is in the Diablo and Gorge reservoirs downstream of the bypassed reach. All available evidence (Brueggeman et al. 1988) suggests that the reservoir populations are surviving without the continued wetting of the bypassed reach. The reach could, however, have been the site of spawning for the reservoir populations that otherwise lack suitable tributaries. We conclude that the proposal to stock the reservoirs to compensate for degraded habitat in the bypassed reach properly places emphasis in an area that is likely to be more suitable trout habitat. No additional measures are warranted.

Gorge Bypassed Reach Anadromous and Resident Fishes

To address continued habitat loss for anadromous and resident fishes in the 2.7-mile-long Gorge bypassed reach, the proposed action would accept these habitat losses but enhance the anadromous fishes in downstream reaches. The proposed action would continue the interim agreements to manage flows downstream of the Gorge powerhouse and would also provide several enhancement measures (nonflow plan) for anadromous species that could be affected under project operations, including steelhead production, chinook salmon research, off-channel chum salmon habitat development, instream or off-channel fish habitat development, and sediment reduction. These plans were developed to address past (from 1981, the beginning of the Interim Agreement) and continuing impacts of the SRP, not just those of the Gorge bypass reach (table 4).

We concur with these proposed actions. Although anadromous salmonids could now have access to the Gorge bypassed reach from the lower Skagit River, this reach was always at the upper end of

anadromous fish distribution (Brueggeman et al. 1988). There was little in the way of good mainstem or tributary spawning habitat in this reach, so flow enhancements in the Gorge bypassed reach would have little value for fisheries. The river below the Gorge powerhouse and the town of Newhalem that is affected by river flows from the powerhouse is of far more value to the anadromous fishery. We view the enhancement actions proposed in the SA as related to impacts of project operations on each species, and therefore, appropriate.

Skagit River Anadromous and Resident Fishes

The proposed project (which is the current condition based on interim agreements now in effect) addresses flows for protection of anadromous salmon, trout, and resident fish habitat in the mainstem Skagit River downstream of Gorge powerhouse. Fluctuating flows affect all life stages of anadromous fishes because flows must be sufficient and stable for upstream migration and spawning, to keep redds submerged, to provide shallows for feeding and rearing of juveniles without stranding them when water levels drop, and for outmigrations of young. The proposed action therefore requires specific measures for each species and life stage. The proposed action in the SA establishes SCL's obligations to continue to (1) provide instantaneous minimum flows; (2) limit downramping to specific rates and times; (3) limit maximum average daily flows during spawning periods; (4) restrict the amplitude of flow fluctuations; (5) monitor and evaluate performance of the Effective Spawning Habitat Model and Temperature Unit Model used in analyses; and (6) conduct field monitoring of salmon and steelhead. Numerical flows and flow rate changes at specific dates, hours, and river gages are complex and are specified in the SA along with sample calculations. Appendix A herein gives the flow regulations proposed in the SA. The functional objectives of the flows specified in interim agreements, and proposed in the SA for continuation, plus additional measures also proposed in the SA, are as follows.

- For spawning salmon and subsequent protection of their redds, the effects of operations are addressed by limiting maximum flow levels during spawning and by maintaining minimum flows throughout the incubation periods. These minimum flows are sufficient to keep most redds covered until salmon have reached the fry stage. We have reviewed SCL's studies that led to the interim agreements that define the current baseline flow regime (Graybill et al. 1979; Stober et al. 1982; Crumley and Stober 1984; Fast and Stober 1984; Brueggeman et al. 1988) and annual data on catches and escapement of Puget Sound salmon (figure 5). We concur that this is an appropriate measure with a proposed schedule adequate for protecting the resource because the salmon stocks have not declined since

the 1978 interim agreements. Relicensing would not change the present operation.

- For newly emerged salmon fry, the effects of operations are addressed by limiting daily flow fluctuations and maintaining minimum flows throughout the salmon fry protection period. Flows maintained are adequate to cover the gravel bar areas commonly inhabited by salmon fry, and downramping is limited to nighttime hours when fish are in the channel where water is deeper. We have reviewed the extensive salmon stranding studies conducted by SCL that led to the present operation under interim agreement (Thompson 1970; Stober et al. 1981; Beck and Associates 1987; and SCL 1989b) and the annual catch and escapement data (figure 5). We concur that these are appropriate measures with a proposed schedule and ramping rates adequate for protection of the resource. Relicensing with the provisions of the SA would maintain or improve the present operation.

- For better understanding of a present declining trend in recruitment of chinook stocks, and determination if the decline is related to project operation, the SA proposes a chinook research program. We believe that this research is related to the project purpose and that the fish tagging, recovery, and evaluations proposed are appropriate.

- For chum salmon spawning and rearing in off-channel areas of the Skagit River downstream of the SRP, the SA proposes a habitat inventory, evaluation, and possible improvement to mitigate for any changes caused by continuing project operations. Because downstream off-channel habitats are often modified by hydropower operations elsewhere, this monitoring and evaluation for continuing project effects seems appropriate. Certain specific areas are proposed in the SA for additional spawning as rearing, including County Line and Newhalem ponds.

- For spawning steelhead in spring and subsequent protection of their redds, the effects of operations are addressed by limiting flow levels during spawning, shaping daily flows for uniformity over the extended spawning period, and maintaining minimum flows through the incubation period. These minimum flows are adequate to keep most redds covered until fry emerge from the gravel. The proposed flow plan continues flows currently maintained under interim agreement. In recognition that these operational flow measures have not fully protected steelhead spawning in years past, nonflow measures in the form of artificial steelhead production are also proposed. The Steelhead Smolt Production Program seeks to increase both winter-run

and summer-run steelhead production in the upper Skagit River upstream of the city of Marblemount. SCL intends to accomplish this project-related enhancement in conjunction with resource agencies, using low-cost, small-scale methods and using existing facilities where appropriate. Alternative projects identified for steelhead production are expansion of the Clark Creek salmon hatchery for steelhead smolt production, development of net pen rearing at existing or new sites, and development of a new facility incorporating all phases of production.

The Skagit River Basin is managed for the natural production of steelhead. Artificial production to supplement harvest has been occurring since 1960. The difference in timing of the hatchery and wild stock precludes or minimizes genetic introgression (entry of one gene complex into another). From 1979 through 1986, natural production demonstrated a steady increase in the Skagit system as a result of deliberate management efforts to maximize production of wild steelhead. The extent of the production increase, however, was significantly less in the 14-mile stream reach immediately downstream of Gorge powerhouse, the habitat most affected by project-induced flow fluctuations. The reduced steelhead productivity and absence of habitat upstream of Gorge dam was the basis for the proposed plan to supplement steelhead population with the proposed increment of artificial production.

We agree that the measures incorporated in the current operating regime under interim agreements are appropriate. However, we find expanded artificial production of steelhead potentially inconsistent with the stated goal of emphasizing basin-wide management of wild stocks in the Skagit River Basin. Although wild steelhead stocks have declined in the basin in recent decades, further work to enhance natural spawning and rearing seems more appropriate to address presumed long-term effects of the SRP. In recognition of this, we consider the Steelhead Smolt Production Program largely an enhancement of the present project-affected resource through supplementation supported by a rationale consistent with the goal of increasing wild stocks. Use of native, wild broodstock would seem essential for the supplementation effort to be considered within the project purpose of fostering wild populations that are affected by continued hydropower operations. New construction of fish production facilities would necessarily lead to temporary increases in construction-related turbidity and some downstream sedimentation. These effects would be minimized by good construction practices.

- For newly emerged steelhead fry, the effects of project operations are addressed by limiting daily flow fluctuations and maintaining minimum flows throughout the steelhead fry protection period adequate to cover areas of gravel bar commonly inhabited by steelhead fry. In addition, downramping during changes in hydropower operations would be limited to a very slow rate when project discharge is moderately low, and limited to a moderate rate when project discharge is relatively high, to minimize or prevent fry stranding on gravel bars. These features continue the present operation under interim agreement. Artificial steelhead production is proposed to address any residual losses as discussed in the preceding paragraph. We concur that these current flow and non-flow measures are appropriate, although there has been insufficient monitoring of stocks to establish the benefits since the interim agreements went into effect.

- The proposed action, currently in effect under interim agreement, recognizes that the operational requirements for protection of anadromous fish spawning, incubation, and rearing downstream of the SRP may not provide full and complete protection of the resources, particularly when uncontrollable flow events occur. However, full protection of the fishery resources remains the goal of the resource agencies, and attainment would require continued cooperation and coordination among SCL and the resource agencies. Therefore, the SA also spells out the conditions, consultations, and alternative requirements during times when water flow in the basin is insufficient to meet the agreed-upon minimum instream flows. Flow insufficiency is addressed by designating "Insufficient Months" based on readings at flow gauges and Ross Lake level and by specifying actions to be taken when an Insufficient Month occurs. The proposed and currently operative action recognizes that circumstances arise in which SCL cannot react to or control flows or other operating factors that affect fish. Circumstances specifically identified when SCL is not obligated to meet specific requirements of the SA include generator outages, emergency conditions, uncontrollable high flows, flood control measures by the Corps of Engineers, firm load obligations by SCL at the time of the agreement, and high sidestream inflows. We reviewed the factors affecting overall fish production in the Skagit River Basin in relation to similar locations (Washington 1984) and conclude that the proposed action is a reasonable approach to minimizing continuing effects on the fishery resource in an unpredictable natural environment.

- For reduction in silt accumulation in the Skagit River that can be aggravated by the continuing upstream SRP operations, the SA proposes instream or off-channel habitat improvement and sediment reduction from tributaries. Because siltation is one of the major causes of spawning habitat degradation, protection from siltation and rehabilitation of silted areas are valid companions to flow measures. We feel that these measures are adequately related to the SRP purpose for them to be considered in relicensing.

- Field monitoring is specified in the proposed action. Monitoring is planned for verifying two models used in establishing flows. These models are the "Effective Spawning Habitat Model" that shows the relationships between spawning flows and succeeding incubation flows, and the "Temperature Unit Model" that predicts the calendar date of hatching and emergence for pink, chum, and chinook salmon and steelhead trout based on river temperature. Monitoring will also identify salmon spawning and steelhead fry protection period start and end dates. Monitoring will establish the effectiveness of fry protection measures by surveying for fry stranding. There is also compliance monitoring using USGS flow gauges in the SRP area. We concur that this monitoring is important for verifying the models used for establishing flows, checking for likely consequences of the ongoing actions, and establishing a basis for selecting appropriate enhancement measures. We consider this monitoring to be an especially important feature of the proposal.

Other Fisheries Alternatives Considered By Staff

The SA proposes certain measures to be taken to protect or enhance fishery resources. Although these measures are appropriate for the Skagit River system as discussed above, they are not the only ones that might have been selected. We evaluated the current proposal and the decade of research that led to it (and previous interim agreements) and identified for evaluation several alternative measures that might have been adopted. These alternatives are discussed briefly below.

Year-round full pool in Ross reservoir.

Current operating practice is to draw down Ross reservoir, the main storage reservoir on the Skagit River, in autumn and winter with refilling after April 15. This drawdown enhances flood control capabilities, generates electricity during the winter high demand period, and maintains suitable water levels during the period of anadromous fish spawning in the river downstream of Gorge dam. However, habitat space is diminished for resident trout and shoreline areas are exposed to erosion,

which causes elevated turbidity in lake water and reservoir discharges. The SA would maintain this operation schedule.

We evaluated benefits to trout from maintaining Ross Lake levels throughout the year compared to effects on downstream fishery resources of not having winter flows available. The trout population in Ross Lake has been outstanding (SCL 1977), is now recovering from a cyclical decline (Scott-Brier 1994), and does not appear to be harmed by drawdown. However, loss of sustained minimum flows in the downstream reaches throughout spawning, incubation, and rearing of salmonids would have severe impacts on populations by reducing spawning habitat, dewatering redds built in higher flows, and reducing fry habitat, as several years of flow studies have shown (Graybill et al. 1979; Stober et al. 1981; Crumley and Stober 1984; Beck and Associates 1987). Loss of downstream habitat would exceed possible gains for reservoir trout. Also, the opportunity to store spring and winter flood waters, thereby reducing floods in the lower valley, would be foregone. Therefore, we do not recommend maintaining full pool levels in Ross reservoir through the year.

Instream flow requirement for the Gorge bypass reach.

Current operating practice is to nearly dewater the reach of the Skagit River between Gorge dam and Gorge powerhouse, a distance of 3 miles. This reach is accessible to anadromous fishes, the main fishery resource, from the mainstem Skagit River. The SA would vacate this reach for fisheries in lieu of improved habitat in the downstream reaches affected by powerhouse flows. Normally, the Commission would require a minimum instream flow in a bypassed reach to protect anadromous fishery resources. An instream flow requirement for the bypassed reach would require spill at Gorge dam.

We reviewed the historical fish populations in the bypassed reach (Brueggeman et al. 1988), analyses by the University of Washington of the downstream problems with fluctuating flows (Graybill et al. 1979), and the fry stranding studies where concern was mostly focused on downstream reaches (Beck and Associates 1987 and previous progress reports) to obtain a perspective on the relative importance of the bypassed reach. It is clear that few anadromous fish used the bypassed reach historically and that fluctuating flows affected the fishery resources mostly in downstream reaches (stranding of fry in "potholes" below the town of Newhalem and dewatering of downstream spawning sites). Therefore, providing a minimum instream flow in the Gorge bypassed reach would reduce power generation and provide minimal resource enhancement. We do not recommend its inclusion.

Alternative detailed flows and timing for redd and salmon fry protection.

Current interim agreements and the SA include detailed specifications of flows and their timing below Gorge powerhouse. For example, the SA specifies that the "spawning period of chinook salmon shall start at 0001 hours on August 20 and shall end at 2400 hours on October 15 of each year." Also, "Incubation flow during days following the spawning period of each species shall be based on the Season Spawning Flow which is calculated as the average of the highest ten (10) Daily Spawning Flows at the Newhalem gage during the spawning period of that species." Appendices are provided in the fisheries agreement of the SA that allow calculation of the needed flows and timing. These detailed criteria were determined by lengthy negotiations between resource agencies, tribes, and the SCL.

We evaluated these detailed criteria with the objective of finding alternative ones that would better serve the fishery resources. The major objection to the current (also the proposed) scheme is its complexity. On careful examination, each of the flow and timing criteria has a valid basis in the life cycle of the species to be protected. Minor adjustments could be made, but the selected values are sound. There are some conflicts between species, however, that do not appear to take into account the simultaneous presence of the species (e.g., "Daily Spawning Flows shall not exceed 4,500 cfs for chinook salmon, 4,000 cfs for pink salmon, and 4,600 cfs for chum salmon . . ."). Where it appears there may be a flow conflict between species, the plan specifies which species are selected to receive flow at a given time to extend maximum benefits to all species. A simpler flow regulation scheme could be devised in which all species are taken together and judgments made initially about which species would be favored when there is conflict in requirements. We believe that this choice, if it is to be made, should be left to the resource agencies and Tribes. Given the multiple choices for optimizing flows and timing presented by the Skagit River anadromous fishes, we do not recommend creating an alternative detailed operating schedule to replace the negotiated conditions. The SA provides for reconsideration of detailed specifications by the parties through consultative groups.

Alternative downramping limitations.

Current interim agreements and the SA limit the amplitude of flow fluctuations and downramping rates to protect both salmon and steelhead fry. The specific hours and dates when these restrictions apply are specified or calculated. Amplitudes of flow fluctuations and rates of downramping depend upon the prevailing flows at the time. Appendices are provided in the SA for making necessary calculations.

We considered alternative amplitudes of flow fluctuations and rates of downramping. The major difficulty with the proposed Flow Plan of the SA and its current voluntary implementation is its complexity. However, detailed examination shows that the conditions selected were soundly based on the field studies in the 1980s of flow fluctuations and their effects on fish (Beck and Associates 1987). Minor adjustments could be made in the detailed values with little overall effect on the SRP or the fisheries resources. Therefore, we do not recommend an alternative set of flow fluctuation and downramping limitations.

Alternative procedures for dealing with insufficient flows.

The SA provides specific procedures to follow if there is not enough water available to simultaneously fill Ross Lake and maintain specified minimum instream flows. There are three specific criteria for determining an "Insufficient Month," each of which involves specified calculations provided as an appendix to the fisheries agreement of the SA. A Flow Coordinating Committee (FCC) is to be convened to consider alternative actions. If no conflicting decision is made by the FCC, the agreement provides for a proportional reduction of minimum flows to be implemented by SCL. SCL would calculate the impending flow deficit and allocate minimum flows to the succeeding months proportionately.

We evaluated the proposed responses to such insufficient flows although we did not develop a detailed independent water budget schedule. The difficulty with the proposed scheme is its potential use of all available water in Ross reservoir to the detriment of fish populations there. In the extreme, there could be major impacts on the habitats of Ross reservoir for minimal gains in habitat for downstream salmonids. The SA provided for mutual discussions by the FCC as the preferred approach to reaching a solution to this potential problem. Parties to the SA assert that neither the current operations nor the proposed plan will use more water than the available active storage of Ross reservoir (Scott-Brier 1994). Impacts to fish resident in Ross Lake will not increase; rather, they will be lessened due to specific measures planned to facilitate access to spawning tributaries. Thus, we recommend no specific alternative arrangements beyond those in the SA.

Alternative Nonflow measures.

The SA proposes several nonflow measures that would reduce impacts to fisheries resources not handled by the flow measures and that might enhance the resource. These measures include a steelhead smolt production program, a chinook salmon research program, an off-channel chum habitat development and improvement program, development of County Line and Newhalem ponds for off-channel spawning and rearing, a habitat improvement and

sediment reduction program, and a resident trout protection and production program. The costs of these programs to SCL are specified, and management responsibilities among the resource agencies and Tribes are usually specified. Some of these proposed projects may be underway as part of interim agreements.

There are many other possible measures that could be undertaken to protect or enhance fisheries resources in the Skagit River Basin. For example, Washington (1984) gave detailed plans for possible fishery enhancements of the upper Skagit River tributaries, mostly in the areas close to confluences with the mainstem. A wide range of options is available for supplementing wild stocks of salmon and steelhead with hatchery production (CBFWA 1990; RASP 1992). There is a need to better characterize the fishery resources of tributaries to the Skagit River downstream of the SRP dams and of the mainstem below the turbid Sauk River (turbidity reduces the ability to make aerial redd counts). This characterization would be useful for putting the effects of the SRP into better perspective. For example, coho salmon populations are low enough to limit fish of coastal mixed-stock salmon fisheries (PFMC 1992), and study of its lost habitat in the basin could provide a basis to improve the fishery (Beechie et al. undated; Reeves et al. 1989). Remediation of features such as landslides that have detrimental effects on fishery resources would be helpful for basin-wide fish production (FS undated). The FS has identified a number of watershed remediation efforts that would be useful for fisheries protection and enhancement (internal FS documents on specific habitat improvement projects).

All of these and other possible proposals have merit. Although the suite of measures selected by the agencies and Tribes for implementation under the SA is logical and appropriate, no specific justifications of these projects in comparison to others are provided in the SA. Such a detailed comparison is beyond the scope of this EA. In lieu of a basin-wide comparison of fisheries needs, we consider the measures proposed in the SA to be logical and appropriate and recommend their acceptance. Moreover, the issues addressed are related to the continual operation of the SRP, as noted above.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that increased sedimentation, changes in flow regimes, and loss of anadromous fish habitat caused by a project might lead to significant cumulative impacts on fisheries. The SA, with or without other measures we have considered, would not change flow regimes or increase the amount of sedimentation, and thus would not further damage existing anadromous fish habitat. Flow changes implemented in recent years to improve conditions for salmonids would remain in place. Moreover, by enhancing the anadromous fish resource in the basin,

the SA would have beneficial effects on salmonid production. Thus, we conclude that the proposed action would have beneficial cumulative impacts on fisheries and no significant adverse cumulative impacts.

Unavoidable Adverse Impacts (Fishery Resources)

All foreseeable adverse impacts have been addressed with appropriate enhancement measures that balance the needs of the fishery resources within an unpredictable environment. The Gorge diversion reach will be dewatered at low flows, but regulation of flows below Gorge powerhouse for benefit of fish and other habitat and enhancement of fish production compensates for the loss in the Gorge diversion reach.

3. Vegetation Resources

Affected Environment (Vegetation Resources)

Vegetation is described for areas adjacent to the reservoirs and for transmission-line corridors. Areas that would be affected by enhancement activities (such as land acquisition and wildlife habitat management) are considered in Section V.B.4.

The three SRP reservoirs occupy about 12,850 acres. Historically, this area consisted mostly of upland forest, with small amounts of riparian forest, riverine habitat, wetland, nonforested areas, and developed areas. Currently, upland and riparian old-growth coniferous forest occupy about 306 acres within 125 feet of maximum pool level, and wetlands occupy 11 acres (Brueggeman et al. 1988).

Terrestrial habitats in many areas exhibit erosion along shorelines and roads, including 1,238 identified erosion sites along shorelines and 18 sites along roads (Riedel 1990). Some of these sites are proposed in the SA for erosion control measures, including 37 developed sites at existing SRP facilities and recreational facilities along shorelines (primarily campgrounds and trails), 18 sites along roads, and one osprey nest site at a shoreline (SCL 1991e). At three campground sites, erosion is present in old-growth coniferous forest habitat. These three old-growth sites and the osprey site are the only erosion sites known to have particularly important habitats or species. At the three campground sites, erosion is affecting old-growth forest habitats along the following lengths of shoreline: 867 feet at Rainbow Point Campground, 98 feet at Devil's Junction Campground, and 110 feet at Boundary Bay Campground.

Power lines associated with the SRP traverse agricultural areas and extensive forests of Douglas fir and western hemlock. In agricultural areas, cultivation of crops mainly determines the type of vegetation growing under the lines. Where lines pass

through forested areas, current vegetation includes various species of grasses, other herbaceous plants, blackberry, shrubs, and saplings. Wetlands, cliffs, rock outcrops, deciduous trees (e.g., alder and maple) and lodgepole pine forests are also present within the corridors (CSI et al. 1989). Corridor vegetation is controlled primarily by manual and mechanical methods to prevent plants, primarily trees, from growing tall enough to jeopardize reliable power-line operation. Spot application of herbicides is permitted where required to control noxious weeds or tree species that sprout, provided all other environmental constraints are met. Herbicide use in the RLNRA is subject to prior approval by the NPS.

SCL conducted a survey for rare plants on power-line corridors in RLNRA from Ross dam downstream to Bacon Creek. No plants listed by the state of Washington as threatened, endangered, or sensitive were found. Also, no candidate species for listing by the FWS (discussed in Section V.B.5) were found (CSI et al. 1989).

Environmental Impacts and Recommendations (Vegetation Resources)

Project relicensing as proposed in the SA would extend the current situation. Minor impacts of erosion on shoreline terrestrial plant communities would continue. These erosion impacts, affecting usually only narrow areas along roads and shorelines, would not cause extensive loss of plant communities. Plant communities in power-line corridors through forested areas would continue to be maintained as necessary for reliable power-line operation. Measures to enhance habitats are discussed in Section V.B.4. A summary of plans for habitat enhancement under the SA is provided in Section III.A.3. There would be no significant cumulative impacts because no change would occur in existing operation.

Unavoidable Adverse Impacts (Vegetation Resources)

Vegetation in power-line corridors and along shorelines would continue to be affected by corridor maintenance and erosion, respectively.

4. Wildlife Resources

Affected Environment (Wildlife Resources)

For most wildlife species that are year-round or summer residents of the Skagit River Basin, the reservoirs provide no suitable habitat. Therefore, the populations of most of these species are limited by the presence of the reservoirs as a feature of the existing environment. Year-round and summer residents in the area include about 16 amphibian species, nine reptilian species, roughly 150 bird species (excluding seabirds),

and about 60 mammal species. Historically, these species would also have occurred in the area now occupied by the reservoirs. Several of these species are listed as threatened or endangered (Section V.B.5). Important game and furbearer species include the black-tailed deer, elk, mountain goat, black bear, cougar, and pine marten. The ecology of these species was discussed in a previously published document for the Skagit River Basin (Commission 1991). No aquatic or terrestrial habitat adjacent to the reservoirs currently appears to be particularly important for wildlife species other than the osprey, which has several nest sites in the SRP area. A nest tree at one site is only 5 feet above the high reservoir level but is not currently threatened by shoreline erosion.

Herbaceous and brushy habitats on powerline corridors provide suitable breeding and foraging habitat for many wildlife species. These species include small-bodied animals, whose habitat requirements are essentially provided entirely within the corridors, as well as larger, more widely ranging game and nongame animals, that use the corridor as only a small part of their home range. The population densities of some wildlife species are probably slightly limited as a result of the corridor vegetation.

Environmental Impacts and Recommendations (Wildlife Resources)

Erosion would continue to affect only narrow areas along shorelines and roads and thus would not significantly affect wildlife populations. However, one site with an osprey nest tree could be affected in the foreseeable future and would be monitored annually under the SA. Erosion control would be applied as necessary to prevent loss of the nest tree (SCL 1991e). Other osprey nest trees would not be threatened by erosion.

Management of habitats in powerline corridors would continue to influence wildlife populations but would not have significant adverse impacts. Vegetation control practices, including periodic cutting and spot application of herbicides, generally do not have significantly adverse, long-term impacts on wildlife populations, even though such practices probably cause noticeable population density cycles in the corridors. However, plant communities resulting from long-term periodic broadcast application of herbicides appear to be less suitable for wildlife than those resulting from cutting or selective herbicide application. An extensive review of literature (NRC 1991) indicates that, in general, powerline corridors have neither significant positive nor negative effects on wildlife.

Collision with powerlines causes mortality in many bird species. Generally, this mortality is not thought to have significant effects on population levels (NRC 1991). Some bird

mortality would likely result from collisions with SRP powerlines, although with unpredictable frequency.

The SA has proposed measures to enhance wildlife populations (SCL 1991c). Details of this proposed enhancement are provided in the Wildlife Habitat Protection and Management Plan of the SA (SCL 1991d); its major feature is habitat acquisition. The SA also proposes various measures that would improve wildlife habitat and address management concerns in the SRP area. The SA also makes various stipulations concerning Ross Lake levels, a wildlife management review committee, wildlife plan reporting and review, management of lands within the Skagit Wild and Scenic River System, and management of NPS lands and wildlife-human conflicts in RLNRA. A summary of the enhancement plans of the SA is provided in Section III.A.3(c).

Specific habitat protection/enhancement plans include acquisition of the following or equivalent land parcels as described in the plan for wildlife habitat protection and management (SCL 1991d).

- An 8-mile-long, approximately 3,800-acre riparian corridor along the South Fork of the Nooksack River. The corridor averages about three-quarters of a mile wide with mixed conifer and broadleaf trees and the river near its center. Heavily used by wildlife, the corridor is one of the most important elk and deer winter ranges in this part of the state. The corridor would be actively managed to provide winter forage for elk.

- Three parcels totaling about 500 acres just north of the riparian corridor, including Bear Lake. Much of the area in these parcels was recently logged. Purchase of these parcels is connected with purchase of the riparian corridor, because the landowner (Crown Pacific Company) wanted to avoid isolation of its land parcels.

- McLeod Slough parcel near the confluence of the Skagit and Sauk rivers at Rockport. Land to be acquired totals approximately 200 acres in a desired location near lands owned by WDW.

- Sauk River parcel near the confluence with the Skagit River. This parcel includes approximately 171 acres of recent clear-cut and mixed broadleaf and conifer forest, heavily used by bald eagles for perching and feeding.

- Five parcels totaling about 875 acres along Rocky Creek, Illabot Creek, and the Skagit River near Corkindale. These parcels include (1) an important eagle feeding and off-river "loafing area" near Illabot Slough and the Eagle Island portion of the Skagit River Bald Eagle Natural

Area; (2) an eagle staging area where Illabot Creek enters Illabot Slough; (3) a large contiguous block of land containing some eagle habitat and lying adjacent to WDW lands in the Illabot Slough; and (4) a communal eagle roost on Illabot Creek, which is used regularly by more than 100 eagles.

Habitat management would be conducted primarily in the riparian corridor to provide winter forage for elk. Existing small clear-cuts would be maintained, and some additional small blocks (20 acres each) may be cleared to develop additional elk forage. A number of roads would be closed within wildlife areas. Other enhancement measures may include wetland restoration and improvement of wildlife habitat in powerline corridors.

Acquisition and management by SCL is likely to prevent clear-cutting in some areas and thus enhance future wildlife populations. Also, habitat management on the riparian corridor should increase elk and deer populations. We concur that these measures would enhance wildlife habitat to a degree and nature consistent with the presence of the SRP. However, the measures proposed in the SA, while admirable and beneficial, have no strong connection with the additional impacts posed by relicensing the project. That is, continuing to operate the project under a new license would not have any appreciable additional impacts on habitat for elk or other wildlife species. Thus, while we approve of the measures and encourage SCL to undertake them, we do not consider them to be matters subject to articles under the terms of any new license. We do, however, recommend measures to support wildlife research, information development, and education of the public.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that relicensing the SRP would not adversely change the existing situation regarding wildlife. Accordingly, we conclude that the proposed action would not have significant adverse cumulative impacts on wildlife.

Unavoidable Adverse Impacts (Wildlife Resources)

None.

5. Threatened and Endangered Species

A biological assessment (BA) for threatened and endangered species has been prepared in accordance with the Endangered Species Act and is included in this EA as Appendix C. The BA was sent to the FWS on May 31, 1994. The FWS responded on August 10, 1994, and concurred with our conclusion that the SRP is not likely to adversely affect federally listed species. The FWS recommended installation of aviation spheres where power lines cross rivers, and we concur with this recommendation.

Affected Environment (Threatened and Endangered Species)

No threatened or endangered plant species listed by the FWS is known to occur in the state of Washington (50 CFR 17.12). SCL conducted a survey for rare plants in power-line corridors from Ross dam downstream to Bacon Creek, but no such plants were found (Section V.B.3).

Several wildlife species listed by the FWS as threatened or endangered may occur on or near the reservoirs and powerlines of the SRP (Frederick 1992), including the northern spotted owl (threatened), bald eagle (threatened), marbled murrelet (threatened), grizzly bear (threatened), and gray wolf (endangered). The ecology of these species in the basin was discussed in Commission (1991). Some of these species may currently have decreased population levels because the reservoirs occupy formerly terrestrial habitats. Owls, eagles, and murrelets may have collided with SRP powerlines, although no collisions have been reported. Also, the bald eagle may be indirectly affected by any impacts of the SRP on anadromous fish, on which eagles feed. No specific case has been identified where the SRP is causing problems for any listed species, and continued operation of the SRP would not likely cause any new direct or indirect impact on listed species or their habitats. The following paragraphs provide more detailed SRP-specific information and assessment of existing conditions for each animal species. In addition, the peregrine falcon (endangered), which is currently absent as a nesting bird but may presently nest in the area, is discussed.

American Peregrine Falcon

The peregrine falcon has begun to recover from population declines caused by pesticide contamination and has reoccupied at least 16 nesting sites in Washington. No active nest sites are located in NCNP or RLNRA, although 13 potential nest sites have been reported to be located in the park (SCL 1989a). Peregrines of unknown breeding status are occasionally seen in the area. Nesting near the reservoirs may be unlikely, because the most attractive sites are located at higher elevations (SCL 1989a). The reservoirs limit the area of foraging habitat available to peregrines.

Bald Eagle

After being greatly reduced by pesticide contamination, populations of nesting bald eagles in Washington are increasing, with most nests located in coastal areas. Although several active nests are present in the Skagit River Basin, none are near the SRP. Several hundred wintering bald eagles are usually present in the Skagit River Basin during December and January. High eagle concentrations occur along the Skagit River between

Rockport and Newhalem, where salmon carcasses washed up on gravel bars provide the primary eagle food source. Communal roosts of these wintering eagles have been located in 10 or more areas along the Skagit River upstream from Rockport. The roost locations shift seasonally and annually. Bald eagles appear relatively susceptible to collision with powerlines, but they are not known to have collided with lines in the Skagit River Basin and are persisting well despite the presence of project transmission lines.

The presence of the reservoirs limits the amount of riverine habitat available to eagles, and Gorge dam operation dewaters the 2 miles of Skagit River between the Gorge dam and Newhalem. The reservoirs also alter downstream river flows. The limitation of riverine habitat, as a feature of the existing environment, probably somewhat limits the potential number of eagles in the area.

SCL (1989a) addressed the effect of altered Skagit River flow on eagles downstream of the SRP. High flows, which included very high peak flows before SRP construction, can reduce salmon reproductive success and sweep salmon carcasses away from gravel bars, thus decreasing salmon availability to eagles. Beginning in 1981, flow fluctuations were controlled to minimize impacts on salmon reproduction. Additional control was begun in 1984, which further increased flow stability. Controls are applied November 15 January 6 to approximate the salmon spawning season. Although greater flows below the Gorge dam after January 6 may wash carcasses away from gravel bars, these flows are generally smaller than those naturally occurring prior to the SRP.

The SCL study addressed the abundance of salmon and overwintering eagles along the Skagit River from Rockport to Marblemount to Newhalem before and after establishment of the 1984 flow controls. Eagle populations in this area had been systematically surveyed by the Nature Conservancy and NPS since 1977, including at least one count per week from early December to early March. WDF had determined annual salmon abundance based on systematic surveys of Skagit River populations. Eagle and salmon populations were highly variable annually and after 1984 were not statistically different from those before 1984. However, the data suggested an increase in salmon and eagles from 1983 to 1988, and any future surveys may demonstrate a statistically significant increase (SCL 1989a).

The annual maximum number of eagles present between Rockport and Marblemount was highly correlated with annual chum salmon abundance but reached an overall maximum (asymptote) beyond which no further increase occurred even when salmon abundance increased to very high levels. This correlation is consistent with results shown by studies of eagles on other river systems in the Pacific Northwest. No significant correlation between eagles and chum

salmon existed between Marblemount and Newhalem, possibly because data on salmon in this area were less complete and because eagles may have a more varied food supply, as they are believed to feed frequently on coho as well as chum salmon in this river reach (SCL 1989a). Thus, the data reported by SCL (1989a) indicate that SRP operation has stabilized flows in the Skagit River and has not caused significant adverse impacts to bald eagles.

Northern Spotted Owl

The northern spotted owl occupies primarily mature and old-growth forest below 4,000 feet above mean sea level and has large home ranges averaging over 7,000 acres (Thomas et al. 1990). Although they have been observed occasionally, spotted owls are not known to nest in the RLNRA or adjoining areas. However, portions of the RLNRA are within a 87,698-acre designated conservation area described in the recovery plan for the spotted owl (USDI 1992). Nesting has not been observed, but the recovery plan estimated that up to 10 pairs could nest in the area if the forests become mature and more suitable for nesting. Critical habitat for the spotted owl does not include any area within the RLNRA (57 FR No. 10:1796-1838, January 15, 1992). The presence of the SRP reservoirs probably limits owl populations in the area to some extent by precluding development of additional old growth habitat.

Marbled Murrelet

The marbled murrelet is a small robin-sized seabird that feeds at sea and nests in large trees in mature and old-growth forests of coastal and inland areas. The murrelet has been observed in suitable old-growth habitat as far as about 55 miles inland and thus could fly or nest near power lines associated with the SRP. The altitude of murrelet flights between the sea and nest sites is unknown; however, these flights are probably high enough to avoid collisions with power lines. No nests are known near the SRP area, and none may be present because the project area is mostly more than 60 miles from marine environments.

Gray Wolf

After being almost eliminated as a breeding resident of Washington by 1930, the gray wolf appears to be making a comeback. About 70 reliable sightings of wolves have been reported in the North Cascades since 1980, including 11 that have been classified as definite wolf sightings (WDW Wildlife Nongame Data System 1992). Sightings have been concentrated around Ross Lake. In May 1990, an active wolf den was discovered near the Canadian border in the RLNRA (FWS 1990). Encounters with recreationists using SRP lands are not likely to adversely affect wolf populations in the area. The continued presence of the SRP

reservoirs, may limit the future number of wolves in the area by precluding development of additional suitable wolf habitat.

Grizzly Bear

The grizzly bear apparently maintains a low population level in the North Cascades region, as bear sightings have been reported occasionally for many years (SCL 1989a). During the last few years, grizzly bear sign has been confirmed in the RLNRA. Grizzlies use a wide variety of habitat types; the continued presence of the SRP reservoirs, may somewhat limit their future numbers in the area by precluding development of additional suitable habitat.

Environmental Impacts and Recommendations (Threatened and Endangered Species)

Under the proposed action, the SRP would continue to operate as it has during recent years. Operational changes made in the 1980s served to stabilize flows to the benefit of anadromous fish, on which bald eagles feed. Additional enhancements under the terms of the SA would further improve the anadromous fish resource. Thus, relicensing the SRP could improve conditions for bald eagles in the basin. Under the SA, there would be no construction or other changes which would adversely affect the endangered species. Habitat acquisition under the SA, though focused on other wildlife (e.g.,elk) would improve habitat conditions in the basin, probably to the benefit of endangered species. We conclude that the proposed action is unlikely to have adverse cumulative or project-specific impacts on endangered species and could produce some beneficial impacts.

Based on the above analysis of existing impacts, we believe that the proposed action is not likely to adversely affect any listed or proposed-listed species. The FWS has concurred with this finding by letter dated August 10, 1994. The FWS request for the installation of aviation spheres at power-line river crossings would be recommended as a condition of any license issued.

Unavoidable Adverse Impacts (Threatened and Endangered Species)

None.

6. Visual Resources

Affected Environment (Visual Resources)

Visual resources are defined as the natural phenomena (for example, water bodies, landforms, vegetation) that make up an area's visual setting. Generally, visual resources contribute to an area's natural beauty and aesthetic appeal. Washington's

Interagency Committee for Outdoor Recreation (IAC) reports that "in a nationwide public opinion survey done for the President's Commission on Americans Outdoors, respondents chose natural beauty as the most important factor in selecting a place to recreate" (IAC 1990).

Historically, the Skagit River Basin has been admired for its outstanding visual qualities. Construction of dams, transmission corridors, and roads that comprise the SRP changed the natural wild scenic resources of the surrounding mountainous Skagit area. By creating the RLNRA, the NPS acknowledged the recreational benefit of the SRP and allowed its continued operation. Thus, visual resource issues are of particular importance in connection with the SRP because most project facilities are located in the RLNRA. Also, many project facilities are visible from the North Cascades Highway, a Washington State Scenic and Recreational Highway.

Some of the most spectacular visual resources in the North Cascade Mountains may be viewed in the vicinity of SRP facilities at Ross, Diablo, and Gorge lakes. Although the lakes are not natural, they have been in existence since the 1920s and have become important visual resources for the entire RLNRA. The lakes are situated in the Skagit River valley and are surrounded by scenic mountain peaks, ridges, and slopes covered with an upland coniferous forest of western red cedar, Douglas fir, and western hemlock. Views from the lakes to the Pasayten Wilderness Area and the North Cascades National Park are dominated by steep mountain slopes that lead to snow-covered peaks in foreground (0.25 to 0.5 mile), middleground (0.5 to 5 miles), and background (5 to 15 miles) viewing distances. Many SRP facilities are visible from popular viewpoints on the North Cascades Highway, trails in the RLNRA, and project reservoirs. These points of access provide views of project facilities and reservoirs with the scenic mountain landscape as a background. Three SCL reports (SCL 1989c,d; 1991g) provide extensive descriptions of visual resources and scenic viewpoints near SRP facilities.

The largest project structures, the Ross dam and powerhouse, are visually prominent from SCL's Skagit Tour route and from Diablo and Ross lakes. Ross dam is not highly visible from the North Cascades Highway, but Ross Lake is visible in the middleground for 4 to 5 miles along the highway. The Diablo dam is visually prominent from the Skagit Tour route, the dam access road, and Diablo Lake. The dam is also visible from some middleground and background points along the North Cascades Highway, and Diablo Lake is highly visible along the highway for 5 to 6 miles. The Diablo switchyard, powerhouse, and incline lift are visually prominent only in close foreground views from the Diablo townsite or along the Skagit Tour route and have low visibility from the North Cascades Highway. The Diablo townsite is viewed primarily by residents and Skagit Tour participants,

although it can be viewed at a middleground distance from the highway. With the exception of some middleground views from the North Cascades Highway, the Gorge dam is not highly visible from outside the dam's immediate vicinity. Gorge Lake is visually prominent between the Diablo townsite and Gorge Creek, because the lake's north bank is adjacent to the highway for about 3 miles. The Gorge powerhouse, switchyard, conductors and insulators, and the Skagit Service Center are all visually prominent from the North Cascades Highway and from within Newhalem. The North Cascades Highway is the main road through Newhalem, so the townsite is visually prominent in the foreground for travelers on the highway (SCL 1991g).

The SRP's transmission corridor (figure 1) stretches from Ross dam southwest to SCL's Bothell and Snohomish substations north of Seattle. The transmission lines and towers are highly visible, especially along sections of the North Cascades Highway between Ross dam and the southwestern boundary of the RLNRA. Transmission lines are in foreground viewing distance at Bacon Creek and Gorge Lake, and in middleground viewing distance at Thornton Creek and Diablo Lake. The areas within the RLNRA where transmission lines are most visually intrusive are viewsheds from Thornton Creek to Sky Creek and at the mouth of Bacon Creek (SCL 1991g).

The SRP also has sections of transmission line (figure 1) that are located in visually sensitive areas outside the RLNRA, such as near the mouth of Diobsud Creek, which has been recommended for Federal Wild and Scenic River status by the FS. Southwest of Corkindale, the lines cross the Skagit River at RM 74, an area designated as a recreation segment of the Skagit Wild and Scenic River. The lines then cross the Sauk River at RM 6, an area designated as a scenic segment of the Skagit Wild and Scenic River, and parallel the Sauk River south to Darrington (SCL 1991g).

Environmental Impacts and Recommendations (Visual Resources)

In support of the SA, SCL conducted an extensive visual resource assessment to determine the aesthetic effects of the SRP (SCL 1989c, d; 1991g). The assessment identified five major landscape zones where the SRP could affect visual resources: the Ross Lake Zone, the Skagit Project Facility Zone, the RLNRA West Entry Zone, the Skagit Recreational River Zone, and the Sauk Scenic River Zone. Visual effects within each zone were characterized and assessed based on four factors: 1) the visual quality of the setting; 2) the visual contrast of project facilities; 3) viewer exposure to project facilities; and 4) viewer sensitivity to the facilities. We have considered visual resource impacts identified in SCL's assessment, as appropriate.

Relicensing the SRP would not create new visual impacts in any of the five landscape zones. Most project facilities have been in place since the 1920s, and relicensing would not require any new facility construction or ground disturbance. Moreover, project operation would be unchanged by the proposals in the SA. However, relicensing would continue the significant visual effects of some project facilities on visual resources in four of the five landscape zones.

Within the Ross Lake Zone, which includes Ross Lake and its shoreline, visual impacts would continue to be primarily related to operational drawdowns in the lake's water level. Ross Lake's highest annual elevation (1602.5 feet above sea level) occurs during summer months, but operational drawdowns during the fall and winter can reduce the peak water level by 70 to 125 feet. Reduced water levels expose unvegetated shoreline that contrasts visually with the lake and its surrounding terrain, and these impacts would continue if the SRP is relicensed. SCL proposes to address these visual effects by filling the reservoir as early as possible after April 15, and by keeping it full through Labor Day weekend, as practicable (SCL 1991g). Because drawdowns would occur when recreational use of Ross Lake and the RLNRA is at a minimum (see Section V.B.8), the continued visual impacts of water-level fluctuations would not be significant.

The SRP would continue to affect visual conditions in the Skagit Project Facility Zone, which includes the area from Ross dam southwest to Newhalem. These persisting effects have the potential for enhancement. The most significant effects involve transmission line and tower visibility, especially in the vicinity of Diablo and Gorge lakes and Goodell Creek. The effects of project dams would continue to be moderate because the dams are not highly visible except to nearby viewers who are often on tours of project facilities. The visual effects of project powerhouses and switchyards would also continue to be moderate. The Ross and Diablo powerhouses and switchyards are not highly visible outside their immediate vicinities, but the Gorge and Newhalem facilities are highly visible in the town of Newhalem. However, the visual contrast between the facilities and the town of Newhalem is low to moderate because the town was built to support development of the SRP (SCL 1991g).

Visual effects would also persist in the RLNRA West Entry Zone, which includes the area from Newhalem southwest to the RLNRA boundary. Transmission line and tower visibility would remain, particularly along the Skagit River between Goodell Creek and Bacon Creek. Transmission line and tower visibility would also continue in the Skagit Recreational River Zone (where the lines cross Diobsud Creek and the Skagit River) and in the Sauk Scenic River Zone (where the lines cross and parallel the Sauk River). Visual conditions are of particular concern in these Wild and Scenic River segments because the FS is responsible for

protecting and enhancing the Skagit system's "outstandingly remarkable" fisheries, wildlife, and scenic qualities.

We agree with the visual resource plans proposed in the recreation and aesthetics part of the SA (SCL 1991i), and recommend as license conditions all of the SA measures for protecting and enhancing visual resources within and outside the RLNRA. The parties to the SA are responsible for implementing visual enhancement measures that are directly related to project impacts. We summarize the provisions of this part of the SA in Section III.A.3. Briefly, the actions outlined in this part of the SA include measures to (1) reduce the visual impacts of project facilities; (2) improve the visual quality of the Diablo and Newhalem townsites; and (3) enhance the visual qualities of areas in and around transmission line rights-of-way.

SCL proposes to improve the visual qualities of project facilities by making improvements to the facilities' appearances. SCL would address the aesthetic impacts of powerline towers, the two surge tanks located above the Diablo and Gorge powerhouses, and the Gorge dam access road bridge by painting them a less contrasting color during SCL's routine maintenance schedule for the SRP. Repainting powerline towers to reduce visual disruption would be most effective on the most visible towers; in some cases, safety constraints may override visual quality considerations in the selection of color. SCL would also redesign or modify the Ross dam broome gate shed and would remove the Diablo person lift within the first 10 years of the new license. In terms of exterior project lighting, SCL proposes to install high-angle cut-off shielding and/or high-intensity sodium lamps to replace the mercury or low-intensity sodium lamps at the three project powerhouses. For project buildings in Diablo and Newhalem, SCL would replace shiny, high contrast or reflective galvanized or aluminum roofing and siding with more visually compatible material during routine maintenance. Finally, SCL would consult the NPS before undertaking any maintenance activities that could alter the appearance of facilities in the RLNRA or before constructing facilities that could be incompatible with the surrounding environment (SCL 1991i).

SCL also proposes several measures to improve the visual quality of the Diablo and Newhalem townsites. One goal in both towns is to decrease views of project facilities from the North Cascades Highway by means of vegetative screening. In Diablo, SCL would screen views of the Diablo powerhouse and existing maintenance facilities by planting trees and shrubs on the side facing the North Cascades Highway. SCL would also revegetate Diablo's shoreline area, set it aside for public use, and enhance existing planting islands with groundcover, shrubs, and trees compatible with native species (SCL 1991i).

In Newhalem, SCL would remove three small storage buildings from the Engineering Row area, and revegetate much of the area with a mixture of native grasses, shrubs, and deciduous and coniferous trees. Directly across the highway from Engineering Row, SCL would relocate some storage buildings and develop a site for a new project greenhouse. SCL would also pave the existing gravel parking lot for recreational vehicles in Newhalem and build planting islands for trees and shrubs in the parking area.

In addition, SCL would undertake various improvements in the vicinity of the switchyard and the Ladder Creek Falls Trail parking area in Newhalem. These improvements would include (1) planting trees and shrubs to shield views of a fence and a large metal warehouse near the maintenance building; (2) paving and marking the gravel parking areas; (3) developing the level area across the river from the Gorge powerhouse into an overlook and information center; and (4) revegetating the roadside edges of an access road that parallels the river south of the maintenance yard (SCL 1991i).

To manage visual resources in and around transmission line rights-of-way, SCL prepared a report entitled Transmission Rights of Way Vegetation Management Plan (SCL 1989c) in support of the SA. The plan outlines two major actions to be undertaken by SCL. First, SCL has developed a range of recommended prescriptions for managing rights-of-way, including physical actions to be taken and examples of plant species to be encouraged. These recommendations may be applied individually or combined as necessary to address the unique circumstances of each site. Second, based on the visibility of powerline features from the North Cascades Highway, SCL identified the following seven visual quality problem areas in the RLNRA requiring more intensive application of the recommendations: Bacon Creek, Damnation Creek, Thornton Creek, Goodell Creek, Gorge Dam Viewpoint, Diablo "Y," and Diablo Overlook. Details of the recommendations for regular and problem right-of-way areas are provided by SCL (1991i) as part of the SA.

Overall, the most significant visual effect of the continued presence of the SRP involves transmission line and tower visibility. Moderate impacts related to other project facilities would be addressed through the proposed action (SCL 1991i) as summarized below. We considered whether the measures proposed in the SA would adequately address the continuing aesthetic impacts of transmission-related facilities in any of the affected landscape zones, or whether we should recommend additional measures. Generally, the plan contains a number of recommended management prescriptions that involve shielding the transmission facilities from public view by planting or allowing various plant species to grow. Even in the problem areas identified as requiring a more intensive application of these prescriptions,

SCL proposals consist of vegetative screening along with painting the towers a less contrasting color.

Burying or relocating project transmission lines to avoid aesthetic effects in visually sensitive areas is discussed in SCL's Visual Quality Mitigation Analysis (SCL 1991g). This analysis argues that underground transmission lines could have highly adverse environmental impacts because they would require additional right-of-way clearing and a pumped-oil cooling system. In addition, the analysis concludes that underground transmission lines would mean high installation costs and greater repair times. The SCL analysis also states that relocating transmission lines would require construction and revegetation time for old rights-of-way and additional clearing for new rights-of-way. The analysis adds that high economic costs would be another constraint to relocating sections of transmission lines (SCL 1991g).

In general, transmission-line burial is a proven technology that, when properly planned and implemented, can result in minimal impacts. Conversely, the cost, difficulty, and potential impacts of burying and subsequently maintaining transmission lines in the geological environment of the basin would be high, perhaps prohibitively so. Accordingly, we conclude that the information provided by SCL is sufficient to determine that transmission-line burial is not a necessary or appropriate enhancement.

Although the SRP has contributed to visual conditions in the basin, relicensing would create no new effects. Moreover, the proposals in the SA would contribute to improving basin-wide visual quality. We therefore conclude that the proposed action would have beneficial cumulative impacts on visual quality.

Unavoidable Adverse Impacts (Visual Resources)

Relicensing the SRP would maintain the existing visual resources including the visual effects along the transmission rights-of-way. Revegetation along the rights-of-way and repainting powerline towers would enhance the visual quality of the existing environment.

7. Cultural Resources

The survey conducted by SCL in support of the SA showed that prehistoric resources (Mierendorf 1991), historic resources, and Native American practices (SCL 1991o; Toothman, Luxenberg, and Maniko 1989; Blukis Onat 1990) may be adversely affected by the relicensing and continued operation of the SRP. Proposals developed by SCL, which we evaluated independently, recommend ways in which each of these effects could be addressed and, in some cases, the resources could be enhanced. The proposed

measures for the cultural resources portion of the SA (III.A.3.e) were formalized at the request of the Commission in two MOAs (February, 1994) with a few amendments. The MOAs were prepared in consultation with the SHPO, the NPS, and the Tribes. The MOAs consolidate all proposed mitigation and enhancement to cultural resources. The two MOAs are identical except for the parties involved. Because the Nlaka'pamux Nation is a Canadian Tribe, the NPS and the Nation cannot sign the same MOA without U.S. State Department concurrence. Therefore, a second identical MOA was prepared. One MOA was signed by the Nlaka'pamux, but not by the NPS and the other was signed by the NPS but not by the Nlaka'pamux Nation. Both were signed by the Commission, the Washington SHPO, the three U.S. Tribes, and SCL. The amendments are as follows:

- revision of the existing MOAs on historic properties and TCPs for the Upper Skagit Tribe, the Sauk Suiattle Tribe, and the Swinomish Indian Tribal Community, and the proposed MOAs on archaeological sites and TCPs for the Nlaka'pamux Nation to include the Commission and the Advisory Council as signatories;

- proposal to explore the contact between Native American populations and in-migrating communities that supported the construction of the dam and document any such information in a report and an interpretive exhibit or tour. The City shall consult with the Tribes and the Nation in its research, and my arrange to combine this work with interviews to be undertaken as part of the ongoing traditional cultural property inventories;

- explanations of schedules for and amounts of money allotted to purchase land and in lieu properties for the Tribes.

The following sections describe cultural resources in the SRP area as identified by requirements of Section 106 of the NHPA.

a. Archaeological Resources

Affected Environment (Archaeological Resources)

Although earlier thought (e.g., Rice n.d.) held that exploitation of the extremely rugged terrain by prehistoric people was unrewarding if not impossible, ample ethnographic and archaeological evidence shows that Native American people have historically and prehistorically occupied the mountainous regions of the Upper Skagit River Valley (Mierendorf and Luxenburg 1987; Mierendorf 1991; Blukis Onat 1991; and Smith 1987). Mierendorf (1991) and Smith (1987) suggested that the Upper Skagit and the Nlaka'pamux (Lower Thompson bands) tribes occupied the area

aboriginally. The subsistence patterns of both groups included fishing and hunting, but the Nlaka'pamux bore more in common with the plateau people to the north and east, and the Upper Skagit exploited the rugged northern Cascade Mountain ecosystem (Mierendorf 1991). Historically, these two groups have occasionally had conflicts concerning overlapping claims.

Sites Identified

An intensive inventory-level survey conducted between 1988 and 1990 located archaeological resources adjacent to and below Ross Lake. Covering 11,747 acres, the survey was confined to two tracts: a forested tract extending from approximately 1,800 feet elevation to the maximum high pool level of 1,602.5 feet elevation; and a drawdown tract extending from the maximum high pool level to the lowest level of the reservoir drawdown for the period of investigation 1,492 feet elevation. The study was conducted in two parts to aid in inferences about potential archaeological resources in the forested tract from the geomorphologically analogous drawdown tract, which is stripped of vegetation and is therefore easier to survey.

A total of 144 prehistoric sites was recorded in the survey area, and 67 isolated prehistoric artifacts or features were found. Site density for the drawdown tract is about eight sites per square mile, almost three times higher than for the forested tract (<3 per square mile). If the pattern observed in the drawdown area is representative of the surrounding forested areas, a high probability exists for identifying sites in the forested areas that could contribute to knowledge of prehistoric subsistence practices. Many archaeological sites were inundated by SRP reservoirs, and others have been effectively destroyed by erosion. Nonetheless, clearing vegetation from the reservoir area has aided the discovery of prehistoric materials and the understanding of prehistoric subsistence practices in the Northern Cascades.

Archaeological sites meet the criteria for listing in the NRHP if they "have yielded, or may be likely to yield, information important in prehistory or history." Of the 144 sites identified, 32 should be tested to determine eligibility for listing in the NRHP. The selection of sites for evaluation was based on such values as "artifact diversity, stratigraphic complexity, presence of features, the potential for dating, and the presence of intact and undisturbed artifact-bearing deposits" (Mierendorf 1991). Those not meeting the criteria for evaluation would be recorded for location and content but do not contain enough significant new information to justify further examination.

Findings at the prehistoric sites can be summarized as follows.

- All sites consist of scattered, flaked stone tools and debitage, sometimes in association with burned bone, fire-modified rock scatters, or rock features.

- A majority of sites have between two and 60 artifacts, and a single site has over 20,000 artifacts.

- All sites are indicative of economic activities and other subsistence pursuits: hunting, gathering, and fishing activities in extremely mountainous landscapes, as well as food processing and other domestic activities.

- Human occupation of the region, based on findings at these sites, appears to go back as far as 10,000 years but was most intensive during the middle to late-Holocene Epoch (8,000 to 3,500 years ago).

- Over 90 percent of the sites are located east of the Skagit River main channel.

Erosion and sedimentation have affected the condition of identified sites as well as others thought to exist but not yet located. Most archaeological sites identified in the survey area at Ross Lake are within the drawdown zone between 1,602.5 feet and the average annual drawdown elevation of 1,517 feet. Shorelines along Ross Lake are retreating rapidly because of steep slopes and fluctuating lake levels. Up to 8 feet of prereservoir deposits have been removed, possibly carrying away artifacts (Mierendorf 1991).

Sedimentation has resulted in thick reservoir deposits on flood plain segments and at the mouths of tributaries, creating an appearance of low site density in these landforms. This is especially true at Big Beaver, Arctic, and Little Beaver creeks, which are likely to have many buried sites. Mierendorf (1991) estimated deposits of postreservoir deltaic sands measuring 5 25 feet.

Environmental Impacts and Recommendations (Archaeological Resources)

Fifteen sites located in the shoreline area are at risk from erosion resulting from continued operation of the SRP. Adverse impacts in this region have been primarily from wave erosion and fluctuating lake levels, which cause shorelines to retreat. The 15 identified sites include 2 whose integrity is being lost and 13 that are not likely to contribute to knowledge of the area (Mierendorf 1991). Measures proposed under the SA include erosion control and monitoring of the shoreline retreat rate.

Twenty-five sites were recorded in the forested tract, five of which are historic. Four of these have above-ground

structures that have been assessed as ineligible for inclusion in the NRHP (Mierendorf 1991). However, these four sites have in-the-ground historic archeological remains that do require National Register evaluation. The fifth historic site has above-ground structures and archeological remains that also require evaluation. Unless SCL were to request, and the Commission to approve, the raising of Ross Dam at some future date, these resources would not be adversely affected by the relicensing of the SRP.

Of the 123 sites recorded in the drawdown tract, 32 need evaluation for inclusion in the NRHP. Most adverse effects in the reservoir are due to erosion, which on some landforms has removed up to eight feet of pre-reservoir deposits. The recommendation for additional investigation (Mierendorf 1991) is based on "artifact diversity, stratigraphic complexity, the presence of features, the potential for dating, and the presence of intact and undisturbed artifact-bearing deposits."

The plan recommended in the SA among SCL, NPS, and the Tribes of the Skagit Systems Cooperative and the plan between SCL and the Nlaka'pamux National conform with the requirements of applicable law and are appropriate in light of the continuing impacts of project operation on cultural resources. On this basis we endorse all components of the SA as implemented by the MOAs.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that the potential for undiscovered prehistoric sites in the SRP area is low. Since then new information has been made available (Mierendorf 1994) indicating that the potential for new sites is high. The SA contains provisions to protect and enhance archaeological resources at new sites. Because of the provisions in the SA, we conclude that the proposed action would, despite increased exposure of sites, have beneficial cumulative impacts. Exposure of sites around the project area and project-related excavation has provided the opportunity to learn more about prehistoric human exploitation elsewhere in the Skagit River Basin where dense forestation makes identification and excavation difficult.

Unavoidable Adverse Impacts (Archaeological Resources)

Sedimentation and erosion of some archaeological sites could continue to some extent despite implementation of the SA.

b. Historic Resources

Affected Environment (Historic Resources)

Historic resources have been defined in the NHPA as properties 50 years or older that contribute to the nation's history and culture. Twenty-three properties within the SRP area have been identified as eligible for listing in the NRHP; however, the proposal has not yet been formally submitted by SCL. These properties are all related to the original construction and operation of the SRP. Many have been in use since construction of the SRP and have therefore been well maintained. Continued maintenance is the goal for these properties. Some have fallen into disuse or suffered natural degradation; others have been converted to new uses. As property owner, SCL is responsible for making all conversions and preservation or technological updates without compromising the integrity of the properties.

Environmental Impacts and Recommendations (Historic Resources)

The plan proposed in the SA and formalized in two MOAs is in conformance with sections 106 and 110 of the NHPA. We endorse all components of the plan as proposed in the SA.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that the SRP had little potential for adverse cumulative impacts on historic resources. Indeed, some SRP facilities are historic sites, and the SA includes positive measures to enhance them. Accordingly, we conclude that the proposed action would have beneficial cumulative impacts on historic resources.

Unavoidable Adverse Impacts (Historic Resources)

Completion of the HRMMP and any subsequent recommendations would result in no remaining adverse impacts.

c. Traditional Cultural Properties

Affected Environment (TCPs)

TCP is a term used to extend the NHPA provisions to cultural phenomena belonging to the practices, lifeways, and identity of a distinctive population not understood in their entirety by what is tangible or visible (Parker and King 1990). TCPs are valued by virtue of an evoked history, legend, or symbolic identification with a dimension of a people's sacred universe. Such properties can help unify the people by enriching their identity and self-knowledge. "Damage to or infringement upon them is perceived to be deeply offensive to, and even destructive of, the group that values them" (Parker and King 1990). The most numerous TCPs in the NRHP belong to Native American populations

(Commission 1991). In 1992, amendments to NHPA specified eligibility of Native American TCPs for the NRHP.

Since the 1970s, four pieces of legislation have been enacted that provide Native Americans with a legitimate interactional role in federal development projects. In 1978, the AIRFA granted legislative protection to many activities and associated properties connected with practicing the traditional way of life. In 1974, the Archaeological and Historic Preservation Act provided for "the preservation of historical and archaeological data ... which might otherwise be lost or destroyed as the result of flooding, the building of access road, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency ..." (16 U.S.C. 469). In 1979, the ARPA secured protection of archaeological resources and sites on public or Indian lands "to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data that were obtained before October 31, 1979" (16 U.S.C. 470aa 470ll). The Native American Graves Protection and Repatriation Act of 1990 encouraged "the in situ preservation of archaeological sites, or at least the portions of them that contain burials or other kinds of cultural items."

In the area occupied by the SRP, demand has increased for information about traditional practices. The decreasing amount of undisturbed land suitable for traditional practice (owing to industrial and commercial exploitation of natural resources in the Northern Cascades region), together with the reawakened interest in these practices, has put additional strain on the few sacred areas that remain. The reduced undisturbed area increases the value of each individual property and increases competition among the Tribes and between the Tribes and interested commercial developers.

A partial list of TCPs was compiled from various written and oral sources at the time of the relicensing survey (Blukis Onat 1991). The survey of TCPs (Blukis Onat 1991) identified the "resources of greatest import [as] those found in the study area leading southwest from Newhalem in Skagit County to the outskirts of Darrington in Snohomish County." The Tribes potentially affected are the Upper Skagit Tribe, the Swinomish Indian Tribal Community, the Sauk Suiattle, and the Colville Confederated Tribes (Chelan, Methow, Okanogan) in the United States and the Nlaka'pamux Nation (Thompson bands) in Canada. The Tribes for which specific agreements under the SA have been developed are the Upper Skagit Tribe, the Swinomish Indian Tribal Community, the Sauk Suiattle Tribe, and the Nlaka'pamux Nation (Tribes).

Environmental Impacts and Recommendations (TCPs)

The Tribes have identified the following continued impacts on traditional cultural values (Blukis Onat 1991):

- continued lack of access to sites with traditional cultural values and significance in the immediate SRP area due to flooding;

- continued impact of the SRP on TCPs and practices in the study area above mean high water through limited access to the area; traditional sites downstream of the SRP continue to be affected by fluctuating water levels;

- continued impact of the SRP on downstream traditional economic activity sites, such as fishing locations, that are intimately tied to traditional cultural values; the necessity of continued negotiations to maintain the fishery;

- continued impact of the SRP on wildlife significant to cultural practices both upstream and downstream on the Skagit River and its tributaries (access to wildlife such as mountain goats, elk, and eagles is limited);

- current impact of project-associated recreation and potential recreational development on traditional cultural values and sites in the RLNRA, administered by the NPS, which continues to be limited in access by the SRP;

- development of recreation in the SRP area and the adjoining NPS properties that would impact traditional cultural values and properties;

- continued effect resulting from the relationship between the SRP, the NPS, and the FS in terms of planning and policies; and

- continued lack of access to archaeological sites and historic information below drawdown zones within the SRP study area.

This list of impacts was used to develop the measures proposed in the SA and formalized in the two MOAs. In compliance with Section 106 of the NHPA, the SA outlined goals (Section III.A.3.e) to address past or continuing adverse effects of the SRP (Blukis Onat 1991).

The adverse effects on traditional Native American practices identified by the Tribes that can be addressed are (1) the potential development of additional recreational areas in the RLNRA and adjoining NPS property; (2) any effects of project

operation on culturally valuable wildlife (e.g. mountain goats, elk, and eagles); and (3) continued lack of access to sites with traditional cultural values and significance in the immediate project area.

The inventory of TCPs and archaeological resources proposed in the SA and the inventory already completed for historic properties meet the requirements of sections 106 and 110 of the NHPA. The NHPA requires federal agencies to take into account the effects of agency undertakings on historic properties, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The proposed inventories are required because the extent of TCPs and prehistoric properties is not known; therefore, effects on them from the proposed undertaking cannot be determined.

We endorse all components of the TCP part of the SA (see Section III.A.3.e) as proposed by the Tribes and SCL. We also endorse the additional stipulations detailed in the MOAs covering cultural resources to which the Tribes, the Advisory Council, SCL, NPS, and the Washington SHPO are signatories.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that the proposals in the SA fully address Native American issues. We therefore conclude that the proposed action would have beneficial cumulative impacts on TCPs and no significant adverse cumulative impacts.

Unavoidable Adverse Impacts (TCPs)

Certain impacts to TCPs, most notably lack of access in the immediate SRP area due to flooding, will continue despite implementation of the SA.

8. Land Use and Recreation

Affected Environment (Land Use and Recreation)

Most of the SRP facilities are located within the RLNRA, a 117,574-acre subunit of the NCNP. (Section V.B.6 contains a description of project transmission lines located outside the RLNRA.) With the exception of lands controlled by SCL within SRP boundaries, the RLNRA and the NCNP are administered by the NPS. North of Ross dam, lands in the RLNRA are used exclusively for developed and dispersed recreation and wildlife habitat. From Ross dam southwest to the RLNRA boundary, lands are used for a variety of purposes, including developed and dispersed recreation, wildlife habitat, electrical power generation (at SCL's Ross, Diablo, Gorge, and Newhalem facilities), transportation (the North Cascades Highway), and small commercial

and residential areas (at the Diablo and Newhalem townsites and the Diablo Lake Resort).

Historically, the area where the SRP is now located has been important recreationally. Both the recreational needs of the area and recognition of its importance have increased steadily. Creation of the SRP altered land use and recreational opportunities. These opportunities extend beyond the relatively small direct contribution to recreation afforded by the SRP. The RLNRA, which was established along with the NCNP in 1968, was set aside as a recreation area partly because of the potential for locating recreation facilities around Ross, Diablo, and Gorge lakes as well as along the North Cascades Highway. NPS management of the RLNRA is intended to provide "a variety of resource-based recreational opportunities for visitors with a broad range of outdoor interests and skills" (USDI 1988). Because of its proximity to the heavily populated urban areas along Puget Sound, the RLNRA serves as an important regional resource for northwest Washington and southwest British Columbia, averaging over 530,000 visits per year (table 5). Most of these visits are concentrated during the summer months of June, July, and August, with virtually all recreation occurring from May through October. The winter closure of State Route 20, generally from mid-November to mid-April, limits access to the area and recreational use.

Table 5. Recreation use in the Ross Lake National Recreation Area. (Sources: SCL 1991h; personal communication with Joyce Brown, NPS, Sedro Woolley, Washington, February 3, 1992.)

Total visits per year						
1984	1985	1986	1987	1988	1989	1990
573,986	565,115	633,343	563,946	524,253	393,698	457,361

Developed recreation facilities are the focus in the RLNRA, as approximately 90 percent of all visitors stay within the North Cascades Highway corridor. The NPS manages a total of 67 developed recreation sites in the RLNRA, including numerous hiking trails, campgrounds, picnic areas, scenic overlooks, interpretive sites, and boat launches (table 6). The Ross Lake Resort, operating under a concession contract issued by the NPS, provides lodging, boat rental, water taxi, and limited services within the national recreation area. The old Diablo Lake Resort buildings were purchased by SCL in 1992; the land remains in federal ownership. Most of the buildings, excluding the

restaurant building, will be removed and the North Cascades Environmental Learning Center will be constructed on the site. SCL will provide funding for design, construction, maintenance and operation of the facility. The North Cascades Institute will provide funding for program, operation and administration support of the facility. The Ross Lake Resort, a floating rustic resort near Ross dam, consists of 14 units with possible expansion to 18 units.

SCL has also developed a number of recreational resources within the RLNRA in conjunction with the SRP. Ross Lake, Diablo Lake, and Gorge Lakes provide approximately 12,850 acres for boating, fishing, and sightseeing. Ross Lake is relatively inaccessible to U.S. powerboat users because its two boat launches are in the Hozomeen Campground, which is only accessible to vehicles from Canadian roads. For this reason, recreation on the southern end of Ross Lake is generally limited to the use of small rowboats, kayaks, and canoes. The NPS manages Ross Lake to retain its character as the only large, wild lake in the region, emphasizing solitude and a wilderness experience. Diablo Lake is accessible to powerboaters, with a launch at Colonial Creek Campground. SCL's maindeveloped recreational program, the Skagit Tours, features a 4.5-mile boat trip on Diablo Lake, a tour of the Ross powerhouse, a dinner at the Diablo townsite, and a trip on the historic incline railway above the Diablo powerhouse. In addition, SCL offers a number of developed recreation sites, including a museum in Diablo and interpretive displays, trails, and picnic areas in Diablo and Newhalem (SCL 1991h).

Environmental Impacts and Recommendations (Land Use and Recreation)

The SRP has had significant past land use impacts on the entire Skagit River Basin. The creation of Ross, Diablo, and Gorge lakes inundated approximately 12,850 acres of land from the Gorge dam north into Canada and provided a regional recreational resource that led to the establishment of the RLNRA. In turn, the RLNRA has had land use impacts elsewhere in the basin, generating tourist revenues that have contributed to economic development and commercial land use in Rockport, Concrete, Marblemount, and other towns in the region. The SRP was directly responsible for the residential and commercial development in Newhalem and Diablo because the towns were established to support the development and operation of the project facilities.

Table 6. Developed recreation facilities in the Ross Lake National Recreation Area. (Sources: SCL 1991h.)

Type of facility	Number of sites or areas	Number of individual units	PAOT capacity1/	Annual capacity2/
Vehicle campgrounds	5	443	1,772	228,024
Backcountry boat-in camps	20	68	272	41,616
Backcountry horse camps	8	12	144	20,160
Backcountry hiker camps	19	46	184	25,760
Resorts	2	32	160	25,860
Boat launches	6	7 3/		
Overlooks	4	116 4/	358 5/	1,827,200 6/
Interpretive sites	1	6 4/	18 5/	36,720 6/
Picnic sites	2	9	36	19,8407/

1/PAOT (people at one time) capacities for campgrounds are based on four people per unit at vehicle, boat, and hiker camps, and 12 people per unit at horse camps. These figures are adopted by SCL consultants and do not represent official NPS standards.

2/Annual capacity reflects variable managed season for different facilities, ranging from 80 days to all year.

3/Represents number of individual launch lanes.

4/Represents number of parking spaces at respective facilities, including oversized spaces for buses or recreational vehicles (RVs).

5/PAOT capacities based on assumed party size of three people per auto and four people per RV.

6/Annual capacity based on PAOT capacity and average visit duration of 30 minutes at Diablo Overlook and 15 minutes at other overlooks.

7/Annual capacity based on PAOT capacity of four per unit and daily turnover factor of two.

Relicensing the SRP would not result in significant new land use impacts. The SRP and its facilities have been in place since

the 1920s, long before the establishment of the RLNRA or NCNP. The SRP has been compatible with NPS management objectives in the RLNRA and provides many of the recreational opportunities that make the RLNRA a valuable resource. Furthermore, there would be no new construction or ground disturbance associated with license renewal. Any land use impacts associated with relicensing would be a continuation of previous impacts from the SRP's operation. Land use patterns in the Skagit River Basin have already been shaped by, and have adapted to, the impacts of the SRP's construction and operation. By comparison, impacts under license renewal would not be significant.

In terms of recreation, relicensing the SRP would have positive impacts throughout the Skagit River Basin. The most obvious impacts are the beneficial ones that have already occurred from the SRP and that would continue under license renewal. Relicensing would allow the continued operation of several important recreation resources, particularly Ross and Diablo lakes and SCL and NPS facilities in the RLNRA. The lakes would remain the central features of the RLNRA, continuing to provide opportunities for visitors from the Puget Sound region and beyond.

Under the terms of the SA, SCL would maintain some existing recreation benefits and opportunities through programs that affect recreation activities in the SRP area. Specifically, SCL would continue its provision of the following programs and services:

- Skagit Tours;
- Skagit Environmental Endowment contributions;
- Diablo Lake tugboat/ferry service;
- the Newhalem Visitor Contact Station;
- public picnic facilities in Diablo and Newhalem;
- maintenance of the Ladder Creek Falls Trail; and
- operation, maintenance, and eventual replacement of the underwater electric supply cable to the NPS campground at Colonial Creek.

In addition to continuing positive impacts, relicensing the SRP under the SA would create new positive impacts on recreation in the RLNRA and elsewhere in the Skagit River Basin. New impacts would result from various enhancement measures to be implemented or funded by SCL under provisions of the SA. These measures, which are proposed in the recreation and aesthetics part of the SA (SCL 1991i) are discussed below.

SCL funding for the initial development and long-term operation and maintenance of the North Cascades Environmental Learning Center is the most important of the SRP's new impacts. Because some of the measures would be implemented inside the RLNRA, license renewal would serve to improve recreational opportunities there, as well as to increase the RLNRA's importance as a regional resource. Measures implemented outside the RLNRA would serve to improve recreational opportunities in Skagit County.

The measures proposed in the SA for recreation are intended to alleviate the effects of water level fluctuations on the use of boat launch ramps and other boating facilities on all three reservoirs. These measures include replacing or modifying the Hozomeen Boat Ramp on Ross Lake, Ross Lake Campground Boat Docks, the Gorge Lake Boat Ramp, and the Colonial Creek Boat Ramp on Diablo lake. The SA contains detailed descriptions of the work proposed for each site (SCL 1991i).

Enhancement measures proposed in the SA are intended to meet area needs by enhancing opportunities for public recreation. SCL's enhancement measures include both site-specific development proposals and mechanisms for funding future recreation activities and needs.

Site-specific enhancement measures are divided between rehabilitation of existing facilities and development of new facilities. Rehabilitation measures are needed because some recreation sites along the Skagit River and in the RLNRA have been damaged by use, no longer have the capacity to meet demand for their use, or are in conflict with other resources in the area. SCL's proposed enhancement measures include remodeling or replacing the Newhalem Visitor Contact Station, modifying the Goodell Creek Raft Access Site, upgrading facilities at the Damnation Creek Boat-in Picnic Site and the Marblemount Boat Access Site, and funding improvements to the Hozomeen Water Distribution System. The SA contains detailed descriptions of the work proposed for each site (SCL 1991i).

Most of the new recreation facilities proposed in the SA are intended to offset increasing demand and heavy use at existing sites supporting similar uses. The proposed enhancement measures in the SA would include funding for (1) initial development and long-term operation and maintenance of the North Cascades Environmental Learning Center; (2) additional facilities at the Gorge Creek and Black Peak overlook sites; (3) a handicapped access area at the Thunder Lake Fishing Facility; (4) upgrades to or new development of trails at Thunder Knob, Happy Flats-Panther Creek, and Desolation-Hozomeen; (5) development of boat and picnic access sites on Rocky Creek, the lower Sauk River, and the Suiattle River; and (6) upgrades to Skagit County's Howard Miller

Steelhead Park. Specific details proposed for each site may be found in the SA (SCL 1991i).

Finally, the enhancement measures proposed in the SA would include future recreation funding for a number of facilities and programs. SCL would provide future funding for interpretive facilities, a bicycle facility needs assessment and resultant capital facilities, recreation needs assessments and resultant capital facilities, intervenor coordination, and ongoing operation and maintenance costs at FS and NPS facilities within the Skagit Wild and Scenic River corridor, the RLNRA, and the North Cascades Highway corridor. The SA contains detailed descriptions of future recreation funding proposals (SCL 1991i).

We agree that the measures identified in the recreation and aesthetics part (SCL 1991i) of the SA would adequately protect and enhance recreation by continuing current programs and creating additional recreational opportunities within the RLNRA and in Skagit County. Because the SRP will continue to be an integral part of the RLNRA, we recommend as license conditions many of the SA measures for protecting and enhancing recreational resources within the RLNRA. However, we recommend as license conditions only those SA measures directly related to continued recreation impacts attributed to relicensing the SRP within the RLNRA. Other measures on the sites outside the project boundary may be laudable and beneficial. The parties to the SA are responsible for implementing recreation enhancement measures outside the RLNRA.

In our analysis of cumulative impacts in the basin (Commission 1991), we found that the original construction of the SRP resulted in the development of many recreational opportunities of basin-wide importance. Relicensing the SRP with many of the measures proposed in the SA would have significant beneficial cumulative impacts on recreational resources.

Unavoidable Adverse Impacts (Land Use and Recreation)

None.

C. Alternative of No Action

Impacts of not licensing the SRP (the no-action alternative) would mean continuing operation of the SRP under annual licenses. Some terms of the SA (in particular, the flow regimes for fishery protection and enhancement) have already been undertaken under interim agreements. Thus, many developmental and nondevelopmental resource effects of this option would be the same as under the proposed action as long as the interim agreements are followed. On the other hand, some or all of the proposed enhancements to resources might be foregone under this option. We cannot state in detail which non-developmental

benefits would not occur because we do not know what measures might or might not be implemented by SCL under other agreements, were the no-action alternative adopted. There would be no clear impetus for SCL to institute the enhancements to fisheries (nonflow plans), vegetation and wildlife, visual resources, recreational resources, or cultural resources that are proposed in the SA and outlined above in Section III.A.3. Thus, under this alternative, there would be fewer beneficial effects on the resources than would occur under the proposed action.

VI. DEVELOPMENTAL RESOURCES

The SRP would be economically beneficial so long as its projected levelized cost is less than the levelized cost of alternative energy and capacity. We expect the SRP to generate about 2,655 gigawatt hours (GWh) annually while providing about 550 MW of dependable capacity. The annualized cost of this power for a 30-year license term period would be approximately $31 million, comprising $20 million O&M, $5.5 million in costs related to the SA, and $5.5 million in capital cost37/ recovery.38/

The components of the SA for a 30-year license term are summarized in table 7.

Table 7. Total (1990 dollars) and annual levelized costs (nominal current-year dollars) of the environmental protection and enhancement measures proposed in the SA for various resources for a 30-year license. Source: The staff.

Resource Area	Total Cost	Annualized Cost
Fisheries (including flow)	$30,068,104	$2,521,516
Wildlife	12,029,437	1,008,791
Recreation	12,267,605	1,028,763
Visual Quality	1,706,613	143,117
Erosion Control	2,099,171	176,037

37/We estimate the remaining unrecovered investment in plant and equipment at about $48 million.

38/Unless otherwise stated, all values reflect annual current-year dollars levelized over a 30-year license period, assuming a general inflation rate of 4%.

Cultural Resources	5,630,117	472,143
Administrative	1,656,249	143,326
TOTAL	$65,457,296	$5,493,693

We estimate SCL's levelized annual cost of obtaining the same amount of energy and capacity produced by the project from another source at about $121 million. This figure was derived from rates for SCL to purchase energy and capacity from BPA as of early 1994, since SCL stated that it would purchase power from BPA that it does not itself produce. This yields a difference between the annual cost of project power ($31 million) and purchases from BPA ($121 million) of $90 million, or about 3.4 cents/kWh. While cost estimates over a 30-year license term are uncertain, we think it reasonable to conclude that the economic benefit to SCL and its citizens of issuing a new license will be quite substantial.

In our view, continued operation of the project consistent with the terms of the SA will allow SCL to continue to provide its citizens with a reasonably priced source of power from a renewable energy resource while also providing substantial benefits for nondevelopmental resources. For this reason, we find the SA fair, equitable, and in the public interest. We further find that the project, if operated under a license consistent with the terms of the SA, will be best adapted to a comprehensive plan for the Skagit River Basin.

VII. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA, 16 U.S.C. Section 797(e) and Section 803(a)(1), respectively, require the Commission to give equal consideration to all uses of the waterway on which a project is located. When the Commission reviews a hydropower project, the recreational, fish and wildlife, and other nondevelopmental values of the involved waterway are considered equally with its electric energy and other developmental values. In determining whether, and under what conditions, a hydropower license should be issued, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

A. Recommended Action

We have evaluated the SA, the SA with minor additions and refinements which we considered, and the no-action alternative. As a result, we have selected issuance of a new license consistent with the terms of the SA as the preferred option. We recommend this option because the net benefits of the SA are greater than the benefits associated with the other alternatives.

The issuance of a new license for the SRP with the enhancement measures provided in the SA (with or without the minor additions and refinements we considered) would allow SCL to continue to operate the SRP as an economically beneficial, dependable, and inexpensive source of electric energy for its customers. The associated environmental benefits that would occur with this relicensing would also benefit the existing natural resource values in the vicinity of the SRP (aquatic and terrestrial resources), as well as other aspects of the existing human environment, including erosion control, cultural resources, recreation, land use, aesthetics, and socioeconomic values.

The beneficial effects on the environment associated with relicensing the SRP would result from the enhancement measures proposed in the SA and summarized in Section III.A herein. The nondevelopmental benefits of these measures include the following:

- reduction of shoreline erosion at selected recreational sites;
- improved habitat and production conditions for salmon, steelhead, and trout;
- improved wildlife habitat in the basin;
- improved recreational facilities;
- higher visual quality near project facilities;
- increased knowledge, protection, and educational value of archaeologic and historic resources; and
- increased knowledge and protection of TCPs for Native Americans.

Our analysis of the proposed SA indicates that SCL and the resource agencies and other parties have formulated a plan for relicensing that strikes a generally reasonable balance between the developmental values of the SRP and the associated nondevelopmental resource values. In addition to the benefits of continued hydroelectric generation (see Section VI herein), the provisions of the SA would provide the major environmental enhancements described in Section III.A.3. Thus, we conclude that the benefits of the measures proposed in the SA justify the costs outlined in Section VI.

We considered some other ways of enhancing environmental resources or supplementing the measures proposed in the SA (Section III.B). However, we conclude that these other measures would not address environmental concerns in a clearly superior manner to the proposals in the SA (e.g., alternative fisheries measures, Section III.B.3), or that the cost and potential impacts of additional measures (e.g., burying a transmission

line, Section III.B.6) would clearly outweigh the environmental benefits of instituting them. Adopting any or all of our additional measures would result in the same general level of developmental and nondevelopmental benefits from relicensing but with either additional costs (e.g., burying a transmission line) or very little additional benefits to nondevelopmental values (e.g., additional erosion control measures), or both. Therefore we do not recommend adding our alternative enhancement measures identified in Section III.B.

We also evaluated the no-action alternative, defined as the continued historic operation of the SRP under the terms and conditions of the existing license without implementing any new environmental protection, mitigation, or enhancement measures. This option would provide the same developmental benefits of the recommended option, as well as many of its fisheries benefits because the flow regimes proposed in the SA are already being followed; however, costs of the measures proposed in the SA for nonflow enhancement of fisheries, and for enhancement of wildlife, recreation, aesthetics, and cultural resources, would be foregone. Although this option has not been proposed, its comparison with the SA assists in making our evaluation of the extent of the changes that would occur with relicensing the SRP as proposed in the SA. Consideration of this alternative is also prescribed by the Council on Environmental Quality.

B. Developmental and Nondevelopmental Uses of the Waterway

We have analyzed the economic effects of providing the various environmental enhancements that SCL would accomplish in accordance with the provisions of the SA (Section VI herein). We conclude that the SRP remains economically beneficial with the recommended enhancement measures and that significant beneficial environmental effects would result from their implementation. Although the continued operation of the SRP would result in some minor unavoidable adverse environmental impacts (e.g., shoreline erosion), these impacts would be offset by the level of other developmental and nondevelopmental benefits that would accrue with relicensing the SRP as recommended.

Because it is not possible at this time to foresee future changes to project operations or other mitigative or enhancement measures that may become necessary to protect the fishery and wildlife resources of the SRP, it is also not possible to estimate the costs of any such measures. Before ordering specific changes to project operation or other mitigative or enhancement measures, as may be recommended by resource agencies in the future, the Commission would provide SCL with the opportunity for a hearing. At such a hearing, any costs associated with the changes that would affect the economic viability of the SRP could be presented and considered.

Section 10(a)(2) of the FPA requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving any waterways affected by the SRP. Under section 10(a)(2), federal and state agencies filed 65 comprehensive plans that address various resources in Washington. Of these, we identified 14 plans relevant to the SRP39/. We reviewed these plans and found no conflicts.

Based on a review of the agency comments filed in this proceeding and on our independent analysis, pursuant to Sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, we conclude that issuing a new license for the SRP consistent with the terms of the SA, as appropriate under the Commission's authority, would permit the best comprehensive development of the Skagit River.

VIII. CONSISTENCY OF FISH AND WILDLIFE RECOMMENDATIONS WITH THE FEDERAL POWER ACT AND APPLICABLE LAW

Under the provisions of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of such resources affected by the SRP.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, given due weight to the recommendations, expertise, and statutory responsibilities of such agency.

39/Statute establishing the state scenic river system, 1977, State of Washington; Pacific Fishery Management Council, 1978, National Marine Fisheries Service; Statewide comprehensive outdoor recreation plan, 1985, Washington Interagency Committee for Outdoor Recreation; 1987 strategies for wildlife, 1986, Washington Department of Game; Hydroelectric project assessment guidelines, 1987, Washington State Department of Fisheries; Natural heritage plan, 1987, Washington State Department of Natural Resources; Woodlands priority plan, 1987, Washington Interagency Committee for Outdoor Recreation; General management plan: North Cascades National Park, Ross Lake National Recreation Area and Lake Chelan National Recreation Area, 1988, National Park Service; Scenic rivers program report, 1988, Washington State Parks and Recreation Commission; Mount Baker-Snoqualmie National Forest land and resource management plan, 1990, Forest Service; Washington outdoors: assessment and policy plan 1990-1995, 1990, Washington Interagency Committee for Outdoor Recreation; State trails plan: policy and action document, 1991, Washington Interagency Committee for Outdoor Recreation; Northwest conservation and electric power plan, 1991, Northwest Power Planning Council; Hydropower development/resource protection plan, 1992, Washington State Energy Office.

The recommendations of the fish and wildlife agencies (outlined in Section III.A.3 herein) were finalized, after a period of negotiation with SCL, in the SA; therefore, the option recommended in this EA, to relicense the SRP with the provisions of the SA, is consistent with recommendations of federal and state fish and wildlife agencies. This determination is based on the fact that the FWS, NMFS, WDF, and WDW are parties to the SA.

IX. FINDING OF NO SIGNIFICANT IMPACT

The SRP is constructed and operating, and no major changes in the SRP features are proposed. Consequently, there would be no known construction-related impacts except for those associated with some of the fisheries, recreational, and cultural enhancement measures.

Implementing the enhancement measures recommended in this EA would ensure that the environmental effects of continued project operation would be mostly beneficial.

On the basis of this independent environmental and economic analysis, we conclude that issuing a license to continue operating the SRP with the recommended enhancement measures contained in the SA, which are appropriate for adoption as license conditions, would not constitute a major federal action significantly affecting the quality of the human environment.

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APPENDIX A. COMMENTS ON THE DRAFT EA AND RESPONSES

SEATTLE CITY ATTORNEY
MARK H SIDRAN

April 19, 1994

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Ms. Cashell:

Subject: Skagit River Hydroelectric Project, FERC No. 553-005

We have received the Draft Environmental Assessment for the Skagit River Hydroproject. We were especially pleased to find that the Commission staff recommends the licensing of the Project with the proposed protection, mitigation, and enhancement measures contained in the Settlement Agreements between the City of Seattle and the Intervenors.

SCL 1 Seattle City Light staff have reviewed the Environmental Assessment and are generally impressed with the synthesis and distillation of the Settlement Agreements and all the other documentation on the Project. It was a difficult task and Commission staff should be commended for their effort. On a more picky, detail level, we did find some errors and several points which should be clarified. The attached set of comments identify where these problems occur in the text.

Thank you for the opportunity to comment on this draft Environmental Assessment. If you have questions, please call Keith Purvis, FERC Licensing and Compliance Program Manager, at (206)386-4551. We look forward to being able to implement the Settlement Agreements.

Sincerely,

MARK H. SIDRAN
City Attorney

Original Signed By:

William H. Patton
Director, Utilities Section

Attachment

cc: w/attachment
All Skagit Relicensing Intervenors
John H. Clements, FERC
Dean L. Shumway, FERC
Thomas A. Dean, FERC
James O. Hunter Jr., FERC

Letter from Seattle City Light (SCL), dated April 19, 1994

SCL-1 Your comment is noted.

SCL 2

p. vii — **2nd sentence of 2nd paragraph:**
"Environmental organizations" was omitted from the list of entities. The North Cascades Conservation Council is not a government entity.

SCL 3

pg. 2 and 3 — **Maps (figures 1 and 2):**
These maps are very difficult to read. Please try to improve the quality.

SCL 4

pg. 5 — **1. Project Description:**
Need to include transmission corridor down to Bothell Substation in the project description.

pg. 6 — **a. Ross Development:**
The gross head is given for Diablo and Gorge Developments but omitted for Ross. Please add this information for Ross.
1st sentence of 2nd paragraph under Ross Development:
The power plant is located on the east bank. Please correct the text.

pg. 7 — **1st sentence in d. Transmission System:**
delete "crosses the Cascade Mountains in" and substitute "out through."
Table 1:
No changes from "Ross No.1" through "Diablo No. 1."
Last 2 lines need to be modified and a 3rd line added so that the last 3 lines of the table should appear as follows:

GO-North Mt.	Gorge to North Mt.	-39.0
North Mt-SN	North Mt. to Snohomish	-38.0
SN-BO	Snohomish to Bothell	5.70

pg. 8 — **top of page following 1st sentence that ends with "regulation studies." add the following:**
This rule curve incorporates the flood control curve, assured refill curve, and fish protection flows.
1st sentence under "2. Background on the Project":
The other main reason for opposition to the relicensing application was the proposed raising of Ross Dam. We suggest adding this.

pg.9 — **2nd to last sentence of 2nd ¶:**
The proposed new dam was to be located at a site on the Skagit River near a small tributary named Copper Creek.
Section 3. Applicant's Proposed Enhancement Measures:
All funding for mitigation and enhancement is expressed in 1990 dollars (unless indicated elsewhere in the EA). This is only occasionally noted when mitigation amounts are reflected in the EA.

Letter from Seattle City Light (SCL), dated April 19, 1994

Response SCL-2. This EA reflects the editorial and factual corrections and suggestions in this comment and in comments numbers SCL-6 through SCL-14, SCL-16 through SCL-20, SCL-22, SCL-24, and SCL-25.

Response SCL-3. We understand that the maps are difficult to read in reduction; however the maps were created from the best and most appropriate material we had. We have attempted to reproduce them in a manner that is more legible. (See also response to comment USDI-6.)

Response SCL-4. See response to comment number SCL-2.

SCL 5

References to various mitigation and enhancement proposals are often grouped, arranged, or described in a format somewhat different from the SA. Occasionally, this results in a mitigation item not being mentioned (or mentioned in a section of the EA or a format which is not easily recognizable to SCL and the Intervenors). Since FERC's intent appears to be to recommend relicensing the SRP with the proposed enhancement measures contained in the SA (EA, p.ix), SCL suggests some explicit statement acknowledging or endorsing all measures proposed in the Offer of Settlement and the individual Settlement Agreements.

SCL 6

pg. 10 — 1st sentence under "a. Geology and Soils"
delete "project related sites" and substitute "sites along the reservoir shoreline."
Insert under last bullet of "a. Geology and Soils":
"In addition, erosion control work will be performed at other sites identified during the license period."
Last sentence under section a.:
Should proposed expenditures for erosion control be broken into $845,000 for identified sites and $500,000 for new sites and maintenance of erosion control structures? Delete "several years" and substitute "thirty years."

pg.10 &/or pg. 12 — "a. Geology and Soils" &/or "c. Vegetation and Wildlife"
The proposed greenhouse should be mentioned in either one or both of these sections as a proposed measure.

SCL 7

pg. 11 — 2nd sentence under "c. Vegetation and Wildlife"
delete "and future" and the "s" in the last word, "periods."

pg. 12 and pg 52 — Comment regarding the land parcels listed on pg. 12 and pg. 52: These properties were specifically listed in the Wildlife Habitat Protection and Management Plan. Although these properties were identified at an earlier date as being highly desirable for purchase, some may no longer be available, or other, more desirable properties may be substituted according to the terms of the Settlement Agreement. The recently formed Wildlife Land Acquisition Group will be responsible for all final decisions related to wildlife land purchases. FERC may wish to revise pg. 12 and pg. 52 accordingly.

Letter from Seattle City Light (SCL), dated April 19, 1994

Response SCL-5. The EA simplifies and summarizes the Settlement Agreements so that any reader can form an impression of the extent and nature of the recommendations. The agreements are fully incorporated by reference, and the proposed action clearly stated as including their provisions. In addition, the Executive Summary has been revised in response to your suggestion. See also response to comment USDI-16 (20)

Response SCL-6. See response to comment number SCL-2.

Response SCL-7. See response to comment number SCL-2.

SCL 7 (contd)

pg. 13 2nd bullet:
In the 1st line, delete $2,320,000 and substitute $2,920,000.
4th line, delete $20,000 and substitute $600,000
d. Visual Resources, 6th (last) bullet, 2nd line: insert the word "significantly" between "could alter."

pg. 14 second bullet at top of page:
This section appears to refer to the landscape mitigation proposed for the area around the Diablo Visitor Center. Revegetation is proposed for portions of the shoreline along Gorge Lake, not Diablo. Text should be changed accordingly.

SCL 8

pg. 15 1st bullet under "Financial commitments" add to beginning of bullet:
"An estimated"
Under "Financial commitments" add the following 4 bullets at the end of the existing 3 bullets:
- $154,167 to each U.S. Tribe for early acquisition of TCPs ($462,501 total)
- one-third of $250,000 to each U.S. Tribe to complete TCP inventory ($250,000 total)
- $500,000 to the Nlaka'pamux for Traditional Cultural Activities
- $100,000 to the Nlaka'pamux to complete TCP inventory.

1st complete sentence following "Financial commitments" bullet points:
delete $1,079,169 and substitute $1,316,669; same line, insert "U.S." between "each tribe";
delete "$3,237,507" and substitute "$3,950,008."
last sentence, same ¶:
delete "of $3,837,507" and substitute $4,550,008.

SCL 9

pg. 20 List of Intervenors:
2nd bullet: delete "Upper"
3rd bullet: insert "Upper" before "Skagit Tribe"; date of motion for intervenor status is missing for the Upper Skagit and the Sauk-Suiattle Tribes -- What is the date?

SCL 10

pg. 21 Regarding Section C. Washington Coastal Management Program: SCL sent letter to FERC (concerning CZMA consistency) dated February 23, 1994. The letter from Washington Department of Ecology is dated February 15, 1994.

Response SCL-8. See response to comment number SCL-2.

Response SCL-9. See response to comment number SCL-2.

Response SCL-10. See response to comment number SCL-2.

SCL 11

pg. 24 **Under General Description:**
93% of the North Cascades National Park Service Complex (Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area) is also designated as Wilderness under the 1964 Wilderness Act. Thus it is incorrect to refer to only 550 sq. miles as designated "wilderness." Substitute wording to state that the U.S. National Forest Service wilderness is approximately 550 sq. miles.
last sentence, 3rd ¶ under "1. Skagit River Basin"
"NCNA" should be "NCNP"

pg. 23 **1st sentence, 1st ¶:**
insert "projects" between "hydropower in"

SCL 12

pg. 25 **2nd sentence of 2nd paragraph**
Slopes reach as high as 90 degrees locally (which is steeper than 90%). Also, it should be noted that detailed landform and surficial geology maps have been prepared for the area (Riedel, 1990).

pg. 26 **Last sentence of 2nd full paragraph:**
It is stated that pool level fluctuations result in less overall erosion on Gorge and Diablo Lakes. It should also be noted that because these reservoirs are in the Skagit Gorge, more of the shoreline is bedrock which makes erosion a less severe problem.
2nd sentence of 2nd to last paragraph:
insert "by the National Park Service" between "dredged in."

pg. 27 **Top of page, sentence that starts on pg 26:**
re-arrange the sentence to read as follows:
"measures will be undertaken during the first 9 years of the license period and locations where erosion monitoring would be performed for potential future action."
1st sentence of 1st full paragraph
delete "Twenty-seven project-related sites" and substitute "Thirty-seven reservoir shoreline sites."
Insert after 2nd to last line of 1st full paragraph:
"In addition, erosion control measures will be taken at other sites identified during the license period."
2nd paragraph:
SCL has problems with the terminology used in this paragraph and offers the following as a re-write:
"We consider that shoreline and road erosion are baseline conditions that will continue to degrade during the new license term unless addressed. The operation of the reservoirs under the proposed action would result in some additional degradation

Letter from Seattle City Light (SCL), dated April 19, 1994

Response SCL-11. See response to comment number SCL-2.

Response SCL-12. See response to comment number SCL-2.

SCL 12 (cont'd)

of the reservoir shorelines. Because it would be impractical to prevent erosion along all eroding shorelines, the erosion control measures as described in the SA have been designed to address shoreline sites where erosion control would be of most value. These sites include campgrounds and trails, project facilities, and areas known to contain sensitive or rare habitat or species. In addition, the SA provides for erosion control work at new sites identified during the license period. We therefore consider that implementing additional measures to prevent degradation of the shoreline is unnecessary.

SCL 13

pg. 28 2nd sentence under <u>Affected Environment (Water Resources)</u>:
typo: "from less that 500" should be "than" and line 18 shows an extra space between "of flood."

SCL 14

pg. 32 Under Section b. Fishery Resources, 2nd paragraph, last sentence:
delete "water" and substitute "accessible habitat"

pg. 33 Delete last sentence of first full paragraph. Begin new paragraph with the following:

"Resident fish population levels, particularly in Ross Lake, exceed predicted pre-project riverine populations (Brueggeman, 1988). This is due principally to increases in habitat area created within the reservoirs. The catchable trout populations in Ross Lake, based on 1970's and 1990's hydroacoustic surveys, have varied from 20,000 to 37,082 fish (Looff, 199)."
Delete last two sentences of first bullet under "Fish Habitats" and insert the following:
"Resident fish production within tributary reaches which traverse the drawdown zone can be affected by the spring and early summer (April-June) refill of Ross Reservoir. The primary effects are inundation of redds and the creation of transitory barriers within the stream channels of the drawdown zone. These transitory barriers (fish migration barriers created by reservoir operations) will be removed by Seattle City Light on an annual basis prior to the trout migration time period."
2nd bullet under Fish Habitats:
We recommend adding the following statement--"There are also cutthroat trout, native char (Dolly Varden and/or bull trout) and small numbers of eastern brook trout."

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Response SCL-13. See response to comment number SCL-2.

Response SCL-14. See response to comment number SCL-2.

SCL 14 (cont'd)

pg. 34 **Line 7:**
Delete the sentence which reads "The river between...dewatered." This is incorrect. Gorge Lake reaches the base of Diablo Dam at full pool.
1st line of 1st bullet:
length of Gorge bypass is 2.7 miles not 1 miles as reported in the EA; please correct throughout the EA.
4th bullet:
The words "and day" should be inserted after the word "year."

pg. 35 **2nd bullet:** delete "to";
last sentence of 1st paragraph:
modify sentence by adding the words in bold--
"...Engineers, **and high or low sidestream inflows.**"
last 3 sentences under "Fish Species":
Run sizes of pink and chum salmon are not low.
Improved river flow management over the last 12 years correlates positively with increased production of these species.

last sentence of page: substitute "Powerhouse" for "reservoir".

pg. 37 **top of page, item (4):**
Insert the following words: "**(4) impacts to resident fish and anadromous salmon...**"
3rd sentence of 1st full paragraph:
After careful review of the DEA, and noting that Appendix A is the City's Fish Flow Plan, it is now apparent that the "<u>interim agreements</u>" referred to in the text are the original 1981 Interim Agreement and the Fish Flow Plan from the fisheries settlement agreement. Evidently, the reason the Fish Flow Plan was referred to as an interim agreement was because the City agreed (written letter agreement in 1991) with the agencies and tribes to implement the Fish Flow Plan voluntarily until the license was granted.
The Interim Agreement approved by FERC in 1981 is less comprehensive and is indexed differently than the proposed Flow Plan. Seattle voluntarily implements the proposed measures to the extent that they do not conflict with the Interim Agreement of 1981. The Flow Plan is intended to replace the Interim Agreement of 1981 and further improve fish habitat conditions. Incorporating the proposed plan (Flow Plan) as articles of the new license could result in increased fishery resource and energy production benefits.

SCL 14 (contd

pg.38 **Heading:**
delete "Ross and" because there is no bypass reach below Ross Dam.
text under Heading:
references to "reaches" should be changed to "reach"; delete "Ross" and change "dams" to "dam" in second line; delete "Each of these" and substitute "This" in 2nd sentence.

pg. 40 **1st ¶ under "Gorge Bypassed Reach...", first sentence:**
bypass reach is 2.7 miles in length (see Section 4 of SCL's AIR response).
last sentence, same ¶
DEA states that these plans address all past impacts. Text should be modified to indicate that these plans address past impacts beginning with year 1981. This change will make the DEA consistent with the settlement agreements.
4th sentence under "Skagit River Anadromous..."
delete the extraneous "the" ("the SA establishes the SCL's obligations...)

pg. 41 **line 5 above 1st bullet:**
substitute "agreements" for "assessments"
2nd bullet, 2nd sentence:
delete "and shoreline drying is minimal" and substitute "where water is deeper."
2nd bullet, last sentence:
Revise this sentence to read: "Relicensing with the provisions of the SA would maintain or improve the present operation."

pg. 44 **line 5 of 2nd paragraph:**
substitute "suitable" for "relatively high."

SCL 15

pg. 45 **Last paragraph regarding complexity of flow plan and simultaneous presence of species:**
We do not propose revision of this language but wish to reconfirm what you discovered when evaluating our flow scheme. The complexity and flexibility of the flow plan were essential given that there are three salmon stocks and three separate steelhead spawning sub-groups. Each species or sub-group has a different spawning period and other divergent lifecycle requirements that demanded differing flow conditions.

Whether some species spawn simultaneously or separately, conflicts in requirements are always settled very simply by selecting the highest incubation flow required for any of the affected species. This approach affords even greater protection to other species or subgroups.

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Response SCL-15. Your comment is noted.

SCL 16

pg. 1st sentence of 2nd paragraph under "3. Vegetation Resources":
delete 11,600 acres and insert 12,850 acres.
last sentence of last paragraph:
delete the word "characterizes" and substitute "is affecting"

pg. 49 4th sentence of 1st paragraph:
insert "deciduous trees (such as alder and maple)" into text after "...rock outcrops,"
5th sentence of 1st paragraph:
delete "by periodic cutting and herbicide treatment" and substitute "primarily by manual and mechanical methods"
6th sentence of 1st paragraph:
SCL has not employed broadcast spraying for over 10 years, therefore delete entire sentence and substitute: "Spot application of herbicides is permitted where required to control noxious weeds or tree species that sprout, if all other environmental constraints are met."

SCL 17

pg. 50 2nd sentence of last paragraph:
insert the word "spot" before the words "application of herbicides,"

pg. 52 Discussion of Wildlife Protection and Management
Please note that SCL is also closing a number of roads within the wildlife areas which will have a positive effect on the wildlife.

SCL 18

pg. 55 last sentence under "Gray Wolf" section:
the word "developing" should be "development"

pg. 56 2nd complete sentence at top of page:
"precluding developing" should be "development"
4th sentence under <u>Environmental Impacts and Recommendations (T & E Species)</u>:
"bald eagle" should be "bald eagles".

SCL 19

pg. 56 & 57 Last sentence that starts at bottom of pg. 56:
Delete this sentence, which is inaccurate, and replace it with:

> "The area currently designated as RLNRA might have been part of the North Cascades National Park if the SRP had not been constructed. The RLNRA not only acknowledges the recreational benefit of the SRP, but (unlike a Park designation) allows the SRP to continue operating."

pg. 59 Last sentence of page:
substitute "enhance" for "preserve" at bottom of page

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Response SCL-16. See response to comment number SCL-2.

Response SCL-17. See response to comment number SCL-2.

Response SCL-18. See response to comment number SCL-2.

Response SCL-19. See response to comment number SCL-2.

SCL-19 (contd)

pg. 60 Insert new sentence following 2nd sentence in 1st paragraph:
"Repainting powerline towers to reduce visual disruption will be most effective on the most visible towers; in some cases, safety constraints may override visual quality considerations in the selection of color."

pg. 61 3rd sentence in 1st paragraph:
Insert "examples of" before "species of plants to be encouraged."
last sentence of 2nd paragraph:
delete the word "only" and add the following to the end of the sentence: "along with painting the towers a less contrasting color."

pg. 62 Suggested re-write of <u>Unavoidable Adverse Impacts (Visual Resources)</u>:
"SRP licensing would result in continued visual effect along the transmission rights-of-way. Revegetation along the rights-of-way and repainting powerline towers will substantially reduce, but not eliminate, the visual impact."

SCL 20

pg. 63 3rd paragraph, 2nd sentence states that 32 sites meet the criteria for listing in the NRHP: The NPS archeologist has estimated that 32 sites should be tested in order to determine eligibility for listing in the NRHP. The survey that identified the 32 sites consisted only of a surface examination of the sites, which doesn't provide a basis for making eligibility determinations.

pg. 64 Last paragraph : EA states that 4 of the 25 historic sites located in the forested tract were found eligible for listing in the NRHP. SCL staff does not agree. Mierendorf (1991, pg 10)) states that, "(T)he structural, above-ground portions of the (historic) sites have been evaluated previously and were determined to be ineligible for nomination to the National Register." Additionally, unless SCL were to consider the raising of Ross Dam at some future date, these resources would not be adversely affected by the relicensing of the Skagit Project.

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Response SCL-20. See response to comment number SCL-2.

SCL 21

pg. 6 The draft EA has overlooked the Settlement Agreement for Archeological Resources between SCL and the Nlaka'pamux Nation. As outlined in that SA, once the studies currently in progress are completed, SCL, in consultation with both the Nlaka'pamux Nation and the U.S. Tribes, will engage a professional archeologist to develop a protection and mitigation plan for all eligible and affected sites.
1st sentence of 2nd paragraph:
insert the "an estimated" before the dollar figure of $1,465,000.
2nd to last sentence of 2nd paragraph:
delete the estimate of $40,000 for phase.
2nd to last sentence of 3rd paragraph:
delete "the scientific community" and substitute "future generations"

SCL 22

pg. 67 Last sentence of first partial paragraph: SCL staff had difficulty understanding the last sentence. For clarification, as outlined on pages 4-1 and 4-2 of the Historic Resources Mitigation and Management plan, the next time the Skagit Tour Guide Training Manual is revised, SCL will incorporate material from the HABS/HAER and NRHP documentation into the manual. In this way, the tour guides will be able to better convey the historical significance of the project to participants of the 1-day Skagit Tours.
2nd sentence of 2nd paragraph:
number of years should be 6, not 5 yrs. of receipt of license.
3rd paragraph of 3rd paragraph:
at end of sentence, delete "on the HRMMP." and substitute "for HABS/HAER documentation."

pg. 68 1st complete sentence at top of page:
The statement regarding the results to be addressed in the final EA can be deleted and the suggested revision is as follows: "SCL submitted two MOA's in February 1994, consistent with the National Historic Preservation Act, which stipulates that SCL will fulfill this information request within one year of license issuance."

pg. 69 Typo in 3rd sentence of 2nd paragraph:
"Okanaga" should be "Okanogan"

Letter from Seattle City Light (SCL), dated April 19, 1994 .

Response SCL 21. The Settlement Agreement will be part of the Agreement with the Nlaka'pamux Nation mentioned in the draft EA had been printed. The EA reflects the [illegible] agreements and understandings by all the parties to address resources concerns.

Response SCL-22. See response to comment number SCL-2.

SCL 23

pg. 71 **Top of page before 1st complete sentence:** It appears that the specifics on Nlaka'pamux SA were overlooked. Suggested addition: "Through an MOA to be developed between SCL and the Nlaka'pamux pursuant to the SA, the Nlaka'pamux would receive an initial $154,167 made in three installments ($80,000, $20,000, and $54,167), three annual payments of $154,167, and a final payment of $17,499 for a total of $500,000.

3rd sentence of top paragraph:
At the beginning of the sentence insert "U.S." between "The tribes".

Last sentence of 1st full paragraph:
substitute "Tribes" for "NPS". SCL will enter into an MOA with the Tribes, not NPS.

SCL 24

pg. 72 **Typo in 1st sentence:** first word "That" should be "The".

Revise 1st sentence of 2nd ¶ and insert new sentence following 1st sentence:
delete the comma between "Tribes" and "SCL", insert the word "and" between "Tribes" and "SCL", and delete ", and the NPS." at the end of the 1st sentence. We suggest deleting the second sentence and substituting the following new sentence:

> "We also endorse the additional stipulations detailed in the MOA's covering cultural resources to which the affected Tribes, SCL, NPS, and the Washington SHPO are signatories."

Suggested rewrite of <u>Unavoidable Adverse Impacts (TCPs)</u>:
Delete existing text and insert the following:

> "Certain impacts to TCP's, most notably lack of access in the immediate SRP area due to flooding, will continue despite implementation of the SA."

pg. 73 **Beginning with the 3rd sentence in paragraph below Table 9:**
Delete from the 3rd sentence to the end of the paragraph and substitute the following:

> "The Ross Lake Resort, operating under a concession contract issued by the NPS, provides lodging, boat rental, water taxi, and limited services, within the national recreation area. The old Diablo Lake Resort buildings were purchased by SCL in 1992; the land remains in federal ownership. Most of the buildings, excluding the restaurant building, will be removed and the North Cascades Environmental Learning

Letter from Seattle City Light (SCL), dated April 19, 1994

Response SCL-23. This EA more effectively explains the agreements and understandings between the various parties. Although the monetary figures are correct to the best of our understanding, they may be presented or organized somewhat differently than expressed in your comment, leading to different values being shown.

Response SCL-24. See response to comment number SCL-2.

SCL 24 (contd)

Center will be constructed on the site. SCL will provide funding for design, construction, maintenance and operation of the facility. The Ross Lake Resort, a floating rustic resort near Ross Dam, is comprised of 14 units with possible expansion to 18 units."

SCL 25

pg. 74 Typo in footnote 1: "horst" should be "horse"

pg. 75 3rd complete sentence from top of page:
Correction of information in top paragraph. There is no powerboat access to Diablo Lake from the old Diablo Lake Resort site. Suggested re-write:
"Diablo Lake is accessible to powerboaters, with a launch at Colonial Creek Campground."

pg. 76 Last bullet under 1st paragraph:
change to read:
"operation, maintenance, and eventual replacement of the underwater electric supply cable to the NPS campground at Colonial Creek."

pg. 77 3rd paragraph under proposed measures:
Measure (): "Thunder Creek" should be "Thunder Lake"
2nd sentence of 4th paragraph:
Typo: the word "recreations" should be "recreation"

SCL 26

pg. 78 Last sentence of top paragraph refers to the Americans with Disabilities Act. We spoke with National Park Service staff and were told that it is neither possible, nor consistent with NPS requirements, for all new recreation facilities to be accessible to the disabled. Of most concern are remote hiking trails, and it is hoped that ADA, like the NPS Management Policies on Accessibility, provides provisions for remote facilities (especially trails) and other situations where strict compliance is not feasible Perhaps adding a sentence which clarifies the exceptions to full compliance could be added to the end of the paragraph.

SCL 27

pg. 79 Footnote No.1: It should be noted that certain specific provisions contained in the Settlement Agreements between City Light and the Intervenors were negotiated based upon an assumed 30-year license period. However, we recognize that the term of the license is the Commission's decision.

SCL 28

pg. 84 II. FINDING OF NO SIGNIFICANT IMPACT:
This section should be rewritten to clarify that the proposed action includes not only the relicensing of the SRP, but also the implementation of the SA with attendant mitigation and enhancement measures. It

Response SCL-25. See response to comment number SCL-2.

Response SCL-26. The final sentence has been revised to reflect possible constraints on implementation of measures for the disabled.

Response SCL-27. The footnote and text have been revised to reflect your comment.

Response SCL-28. The Finding of No Significant Impact section, as written, is consistent with current Commission practice and policy. The points you raise in your suggested revision emerge from the body of the EA on which the Finding is based. Thus, although we note your comment, we have left the Finding as presented in the draft EA.

SCL 28 (cont'd)

should also mention the high level of public participation in the negotiation process. SCL suggests the following:

> "The SRP is constructed and operating and no major changes in the SRP features are proposed. The proposed action includes not only the relicensing of the SRP, but also the implementation of the SA with attendant mitigation and enhancement measures. Any construction-related impacts associated with mitigation or enhancement measures shall be adequately mitigated through the use of best management practices and compliance with applicable environmental regulations.
>
> "The SA is the product of years of public involvement and negotiations between SCL and the intervenors; the broad range of environmental issues raised by the intervenors, and subsequently addressed by the SA, produced an action which is in the public interest. Implementing the mitigation and enhancement measures recommended in this EA would ensure that the environmental effects of continued project operation would be mostly beneficial.
>
> "On the basis of this independent environmental and economic analysis, we conclude that issuing a license to continue operating the SRP with the recommended mitigation and enhancement measures contained in the SA would not constitute a major federal action significantly affecting the quality of the human environment."

United States Department of the Interior

OFFICE OF THE SOLICITOR
Pacific Northwest Region
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APR 19 1994

Honorable Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 N. Capitol Street, N.E.
Washington, D.C. 20426

Re: Skagit Hydroelectric Project, FERC Project No. 553:
U.S. Department of the Interior's Comments on the Draft Environmental Analysis of the Skagit Project

Dear Ms. Cashell:

The Department of the Interior (Department) appreciates this opportunity to comment on the Federal Energy Regulatory Commission (Commission)'s draft Environmental Assessment (EA) for the Skagit Hydroelectric Project. The Department submits the following comments.

General Comments:

USDI 1 As you are aware, the applicant and the intervenors in this matter have, through negotiation, concluded settlement agreements resolving environmental concerns connected with resolved issues regarding the impacts of the Skagit Hydroelectric Project. In the opinion of the Department, other resource agencies, Indian Tribes, public interest intervenors, and applicant Seattle City Light, the complex of remedial actions agreed to and specified in the nine Settlement Agreements provides adequate protection, mitigation, and enhancement under applicable federal law. The Department is pleased that Commission staff recommend adoption of the settlement agreements unchanged. While there may be disagreement with regard to the extent of initial or continuing impacts of the Skagit Project on environmental and cultural resources, in the view of the Department, the impacts have been sufficiently addressed to reach the accommodation reflected in the Settlement Agreements. However, the Settlement Agreements were not intended to predetermine the extent of impacts from the project, with or without mitigation.

USDI 2 At various places in the draft Skagit EA, Commission staff use language and reasoning which reflect staff's current position on certain generic issues regarding the requirements of the National Environmental Policy Act (NEPA). These include the range of alternatives available to the Commission during licensing of an existing project under Section 15 of the Federal Power Act; the "baseline" used to determine whether the Commission has provided adequate "protection, mitigation and enhancement" of fish and wildlife resources; the Commission's obligation to mitigate for continuing harm; and related issues. As a general matter, the

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-1. Your comment has been noted.

Response USDI-2. Your comment has been noted.

Department's view is that an appropriate NEPA analysis contains, at a minimum, the following components: (i) a reasonable range of alternatives, including appropriate review of the no-action alternative (e.g., license denial); (ii) an evaluation of project impacts from the appropriate baseline (i.e., pre-project conditions); and (iii) a legally sufficient cumulative impact analysis. In accepting the Settlement Agreements, the Department does not acquiesce to the language of the draft EA as appropriate interpretations of the National Environmental Policy Act or the Federal Power Act as the statutes relate to the licensing of existing projects. See July 16, 1993, letter from Acting Assistant Secretary for Fish and Wildlife and Parks to Secretary Cashell for further discussion of the Department's views on NEPA requirements in conjunction with proposed licensing/relicensing of hydroelectric projects.

USDI 2 (contd

USDI 3

The Department also finds that the proposed federal action under NEPA review needs to be more clearly stated. The proposed federal action is to license the Skagit Hydroelectric Project as mitigated by the measures described in the Settlement Agreements and to approve the Settlement Agreements and the implementation of the mitigation and enhancement measures embodied in the agreements. In addition, the Settlement Agreements describe the preferred alternative. Since the various Settlement Agreements are part of the proposed action and comprise the preferred alternative, the Settlement Agreements and the measures embodied therein should be incorporated into the Commission's NEPA documentation by reference. Moreover, the Settlement Agreements are predicated on a 30-year licensing period; the Commission's NEPA review should clearly state that the proposed licensing period is from 1994 to 2024.

Specific Comments:

USDI 4

Page viii, bullet 3: Revise "resident fish" to read "anadromous and resident fish".

USDI 5

Page ix, lines 4 and 8: The measures described by the Settlement Agreements included mitigation, compensation, and enhancement [illegible] characterize all such measures as enhancement distorts the facts [illegible] the case and the intent of the settlements. For example, [illegible] objective of the fisheries settlement is to fully mitigate all project-induced adverse impacts to the fisheries resource, and where possible realize an enhancement of that resource. Full mitigation was an objective of the wildlife settlement as well but, as the parties realized, mitigation opportunity and funding were among the limiting factors.

USDI 6

Pages 2 and 3: These maps are very poor quality; better maps should be substituted from the many in the various documents that support this EA.

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-3. The Executive Summary, Section III.A, and Section IX describe the proposed action as relicensing the project under the terms of the Settlement Agreements. We regard these statements as sufficiently clear. The Settlement Agreements are incorporated by reference in Section III.A. The license period will be determined in a license order.

Response USDI-4. This EA reflects the editorial and factual suggestions in this comment and in comments numbers USDI-7, USDI-9, USDI-12, USDI-13 through USDI-15, USDI-17, USDI-19, USDI-21, USDI-22, USDI-24, USDI-27 through USDI-32, and USDI-34.

Response USDI-5. The Commission regards the measures undertaken as enhancements to the existing environment, which includes the project as currently constructed. Your different view is noted.

Response USDI-6. In this EA, we have reproduced the figures in a manner which makes them more legible.

USDI 7

Page 4, § III.A.1: The source of this information should be cited.

Page 6, para. 2: This paragraph needs to be corrected to state that the Ross power plant on the southeast bank, about 1,100 feet downstream from Ross dam.

Page 6, § III.A.1: The age of the dams should be mentioned.

Page 7, § III.A.1.d: The first sentence implies that the transmission system crosses the Cascade Crest which it does not.

Page 8, § III.A.1.e: It should be noted that Ross reservoir elevation is governed by three rule curves: the refill guide curve, the critical rule curve, and the flood control curve.

USDI 8

Pages 9-16, § III.A.3: This section is intended to summarize the "Applicant's Proposed Enhancement Measures." This section should be more specific and complete and list all the proposed measures/actions in the Settlement Agreements. Where appropriate, the listed proposed measures/actions should be numbered and maps should be included to show the locations of the numbered proposed measures/actions.

USDI 9

Page 9, § III.A.2, last para., last sentence: The new dam was proposed on the Skagit River near the confluence of Copper Creek, not on Copper Creek.

USDI 10

Page 10, § III.A.3: The proper heading is "Applicant's Proposed Mitigation or Enhancement Measures" and should be so worded here in the heading and the first sentence of this subsection.

USDI 11

Pages 10-16, § III.A.3: The individual discussions of the Settlement Agreements should use the same titles (headings) as the respective agreements to avoid confusion. For example, "Erosion Control" should be used instead of "Geology and Soils" or "Wildlife" should be used instead of "Vegetation and Wildlife".

USDI 12

Page 10, § III.A.3.a, first sentence: In this subsection, "Geology and Soils," it should be noted that there are thirty seven "sites along reservoir shorelines" instead of "project related sites".

Page 10, § III.A.3.a, last sentence: It should be noted that proposed expenditures for erosion control are broken into $445,000 for identified sites and $500,000 for new sites and maintenance of erosion control structures and that the expenditures are spread over the 30-year term of license.

USDI 13

Page 11, § III.A.3.c, line 6: The words "and future" should be deleted. The effective period of the Settlement Agreements is the 30-year term of the license.

Letter from U.S. Department of Interior (USDI), dated April 19 1994

Response USDI-7.

Response USDI-8. Having incorporated the Settlement Agreements by reference (Section III.A), we believe a complete recitation of every detail would be needlessly repetitious and would significantly increase the length of an already long EA. The summary serves to convey to a reader the nature and extent of the agreements. No change has been made.

Response USDI-9. See response to comment number USDI-4.

Response USDI-10. See response to comment number USDI-5.

Response USDI-11. The headings reflect Commission staff's current formatting conventions for EAs and have been left as presented in the draft EA.

Response USDI-12. See response to comment number USDI-4.

Response USDI-13. See response to comment number USDI-4.

USDI 13 (contd)

Page 12, bullets 1 through 5, and page 52: The real estate market is dynamic; some parcels have been acquired while others are no longer available. The parties to the settlement have formed a Land Acquisition Group to perform this function. These sections should be revised to accommodate the needed flexibility.

Page 12, bullet 10: This bullet should be reworded as follows: "management of conditions that could contribute to wildlife-human conflicts on SCL-owned land."

Page 13, bullet 2: The total amount for long-term environmental monitoring is $600,000, not $20,000. The phrase should state "long-term environmental monitoring by the NPS in RLNRA (total of $600,000 or annual payments of $20,000 per year" not "long-term environmental monitoring by the NPS in RLNRA (total of $20,000)".

USDI 14

Page 14, bullet 2: This statement is misleading and inaccurate. We believe the work is actually to occur on Gorge Reservoir near the community of Diablo.

USDI 15

Page 14, § III.A.3.e, sentence 1: The following should be added to this sentence: "in consultation with the NPS and the Washington SHPO."

Page 15, bullets 8 and 9: The Memoranda of Agreement have already been signed and should be so reflected here. Further, the combination of the MOAs into a single MOA as initially requested would have required compliance with the requirements for the National Park Service to enter into an agreement to which a foreign party is also a signatory.

USDI 16

Page 16, bullet 4: This bullet should be revised as follows: "provide funding for design, construction, and operation of the North Cascades Environmental Learning Center, additional facilities at the Gorge Creek and Black Peak overlook sites, handicapped access at Thunder Lake, various existing or new trails, various boat and picnic access sites, and upgrades to Skagit County's Howard Miller Steelhead Park...." In addition, instead of stating "various existing or new trails or various boat and picnic access sites..." the proposed actions should be described, including the additional facilities, trails, and other developments or improvements (see page 15 of the Offer of Settlement).

USDI 17

Page 17, § III.A.4: The last sentence of this subsection should add "for the term of this license."

USDI 18

Page 21, Section IV.B: Compliance pursuant to section 404 of the Clean Water Act and the Washington State Department of Wildlife Hydraulic permits should be mentioned.

USDI 19

Page 22, Section V.A.1, para. 3: "NCNA" should be "NCNP".

Letter from U.S. Department of Interior (USDI), dated April 12, 1994

Response USDI-14. See response to comment number USDI-4.

Response USDI-15. See response to comment number USDI-4.

Response USDI-16. This EA reflects most of your editorial and factual corrections and suggestions. However, the intent of the EA is to summarize, not repeat, material which is available elsewhere and which has been incorporated by reference. Thus, this EA does not include a complete description of trails and facilities as requested in your comment.

Response USDI-17. See response to comment number USDI-4.

Response USDI-18. Any needed permits under Section 404 of the Clean Water Act and equivalent state requirements would be sought and obtained by SCL after issuance of the license, and is therefore outside the scope of this proceeding. No change has been made.

USDI 19 (contd)

Page 23, lines 7 and 9: Delete the word "the" before "determining" and add "projects" after "hydropower," respectively.

USDI 20

Page 25, § V.B, "Proposed Project:" This section should be organized and titled like the Settlement Agreements with all projects listed and numbered to coincide with appropriate maps for project site locations.

Page 25, § V.B.1, para. 2, sentence 2: Slopes reach as high as 90 degrees locally (which is much steeper than 90%); the sentence should read "as high as 90 degrees locally." Also, it should be noted that detailed landform and surficial geology maps have been prepared for the area (Riedel, 1990).

USDI 21

Page 26, third full para.: The last sentence states that smaller pool level fluctuations result in less overall erosion on Gorge and Diablo Lakes than on Ross Lake. It should also be noted that because these reservoirs are in the Skagit Gorge more of the shoreline is bedrock, which also makes erosion a less severe problem.

Page 26, fourth full para.: Although it is true that channel shape, bed elevation, and channel position have changed little since closure of Ross Dam, the project could still be adversely affecting spawning by loss of gravel recruitment and armoring/coarsening of the bed of the Skagit River.

Page 26, fifth full para.: What is the basis for the statement that spawning gravel is plentiful? In what reach of the river?

Page 26, sixth full para.: Note that dredging in Thunder Arm is confined to the area in the vicinity of the boat launch ramp at Colonial Campground. Dredging in this area is done periodically to permit continued recreational use of the launch ramp, due to erosion and debris flows from Rhode Creek

Page 27, first full para., first sentence This sentence should read "Thirty-seven reservoir shoreline sites...," not "twenty seven project-related sites". Thirty seven is the correct number and "reservoir shoreline" is much more descriptive than "project related."

Page 27, second full para., penultimate sentence: This sentence states that "such degradation would not have clear adverse impacts on any important resources." This sentence is inaccurate: loss of terrestrial habitat by shoreline erosion is the loss of a valuable resource - especially since most low elevation/low-relief topography in the upper Skagit River is flooded by the reservoirs. The previous statement also is inconsistent with other statements in the EA, e.g., later on the EA states that old-growth forests are being eroded on Ross Lake.

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-19. See response to comment number USDI-4.

Response USDI-20. The EA is formatted according to Commission staff's current conventions for EAs. The EA is intended as a review and analysis of environmental concerns. It should not present an exhaustive repetition of material available elsewhere. See also response to comment number SCL-5.

Response USDI-21. See response to comment number USDI-4.

Page 28, para. 2, line 9: Change "that" to "than."

Page 28, para. 2: A sentence should be added at the end of the paragraph: "There have been significant natural debris flows on some streams in the National Recreation Area."

USDI 22

Page 32, first full para.: This paragraph states that the effects of the project on water quality are minor. There are no studies cited or any evidence to suggest that the effects are minor. Please note Seattle City Light's program for managing PCBs within the project area. The EA should include a discussion of the effects of the Project on water temperature and reference Bob Gibbon's research.

Page 32, third full para.: All references to Dolly Varden should also include bull trout or native char (candidate species for threatened and endangered status). Both forms occur in the Skagit drainage, and there has been no definitive study that separates these species for the Skagit. In the second sentence, replace "markedly enhanced habitat" with "may have enhanced" or cite information that supports this statement. The newly created reservoirs increased the quantity of habitat for resident species, but there is no evidence that it has been enhanced.

Page 32, fourth full para., second sentence: This statement would be more accurate and acceptable to a greater number of parties if revised to read as follows: "The upper limit of anadromous fish migration on the Skagit River more likely than not included the vicinity of the Reflector Bar and Cedar Bar on the mainstem Skagit River and Stetattle Creek, all located upstream of Gorge Dam and downstream of Diablo Dam."

Page 32, fourth full para., last sentence: Replace "water" with "accessible habitat."

Page 33, bullet 1, second to last sentence: This sentence should be revised to reflect that the reservoir is usually filling in the spring and summer. This may adversely affect resident trout by inundating spawning redds that may subsequently be covered by sediment. Prior to reservoir refill, migratory barriers to spawning trout occur on some tributaries.

Page 34, bullet 1: This paragraph should be revised to reflect that the Gorge bypass reach is fairly well populated with resident fish, including anadromous species at the downstream end. The habitat quality is good at fairly low flows. Habitat quality in much of the bypass reach becomes marginal at normal Skagit River flows due to severe cascades and rapids.

Page 34, bullet 2, sentence 2: The sentence should be revised to read "The present flow regime is a product of negotiations and

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-22. See response to comment number USDI-4.

interim agreements between SCL and the resource agencies since the mid-1970s."

USDI 22 (contd)

Page 34, last para. and bullets, and page 35, bullets: This discussion of "aspects of the existing flow regimen the mainstem Skagit" should note that other aspects that are important to salmon habitat are side-channel habitat and the reduction in large woody debris recruitment. Side-channel habitat, which is important to rearing and spawning, has been lost by reducing the frequency and magnitude of flooding that existed prior to project construction. The reduction in large woody debris recruitment from the upper Skagit, above the dam, has occurred due to the dams.

Page 35, second full para., penultimate sentence: This sentence should be revised to show that run sizes of pink and chum salmon are not low. Improved river flow management over the last dozen years correlates positively with increased production of these species.

Page 35, last para., penultimate line: Replace "reservoir" with "Powerhouse."

Page 37, first full para., third and fourth sentences: These sentences are incorrect and should be revised in accord with the following. The Interim Agreement approved by the Commission in 1981 is less comprehensive and is indexed differently than the proposed Flow Plan; Seattle City Light voluntarily implements the proposed measures to the extent that they do not conflict with the Interim Agreement of 1981. The Flow Plan is intended to replace the Interim Agreement of 1981 and further improve fish habitat conditions. Incorporating the proposed Flow Plan as articles [illegible] the new license could result in increased fishery resource and energy production benefits.

Page 37, fourth full para., second sentence: Woodin et al. [illegible] appears to be an incorrect citation for this work.

Page 38, last para., first and second sentences: The bypass [illegible] is about 2.5 miles on the United States Geological Survey map

USDI 23

Page 38, second full para.: This paragraph should note that [illegible] melt floods are an important component of the hydrology of the Skagit River. Also, the lowest recorded flow at the Newhalem [illegible] was 54 cfs in 1943 and peak flows at the same gage exceeded [illegible] cfs before dam closure.

USDI 24

Page 40, first full para., last sentence: This sentence is [illegible] curate and should be revised to provide that the plans [illegible] developed to address impacts since 1981, the beginning of Interim Agreement.

Page 41, line 5: Replace "assessments" with "agreement."

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-23. This interesting information has not been included since it does not affect the analysis. A summary description of historical floods, including those following rain-on-snow events, is given in the first paragraph of Section V.B.2.

Response USDI-24. See response to comment number USDI-4.

USDI 24 (contd)

Page 41, bullet 2, last sentence: This sentence should be revised to read: "Relicensing with the provisions of the SA would maintain or improve the present operation."

Page 42, sentences 2-4: The Skagit River Basin is managed for the natural production of steelhead. Artificial production to supplement harvest has been occurring since 1960. The difference in timing of the hatchery and wild stock precludes or minimizes genetic introgression. From 1979 through 1986, natural production demonstrated a steady increase in the Skagit system as a result of deliberate management efforts to maximize production of wild steelhead. The extent of the production increase, however, was significantly less in the 14 mile stream reach immediately downstream of Gorge Powerhouse, the habitat most affected by project-induced flow fluctuations. We believe that this continuing impact of reduced steelhead productivity and the ongoing loss of habitat upstream of Gorge Dam justifies mitigation in the form of the plan to supplement the steelhead population with the proposed increment of artificial production.

USDI 25

Page 44, second full para., sentence a: Replace "relatively high" with "appropriate."

USDI 26

Page 44, fourth full para., penultimate sentence and page 45, para. 1: Normally, the Department would recommend an instream flow for a bypassed stream reach. However, it has been established in this case that a bypass flow would produce only a slight increase in habitat value in the bypass reach and would not allow access to habitat upstream of Gorge Dam that is largely inundated by the reservoir in any event. More fish habitat value, and energy, can be extracted by carefully managing its release from the Gorge powerplants.

USDI 27

Page 44, para. 3, sentence 2: The statement that "The trout population in Ross Lake is now outstanding..." is old information, no longer true, and should be corrected. The trout population may have been outstanding in 1977 but is currently recovering from a significant decline.

Page 45, last para.: The Flow Plan is indeed complex, but it is demonstrably workable. Where it appears there may be a flow conflict between species, the plan specifies which species controls flow at a given time to extend maximum benefits to all species.

USDI 28

Page 46, second full para., second sentence: This sentence incorrectly states that the current and proposed schemes are the same. The current scheme is the Interim Agreement of 1981; the proposed scheme is the Flow Plan of the Settlement Agreement. Seattle City Light presently voluntarily implements the Flow Plan to the extent that it does not conflict with the Interim Agreement.

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-25. We have adopted the wording suggested by SCL (see comment number SCL-14).

Response USDI-26. Section V.B.2.b of the EA already discusses the possibility of releasing flow in the Gorge reach and concluded that the approach proposed is satisfactory. Your comment is noted.

Response USDI-27. See response to comment number USDI-4.

Response USDI-28. See response to comment number USDI-4.

USDI 28 (cont'd) Page 46, last para., sentence 2: Neither the current operations nor the proposed plan will use more water than the available active storage of Ross reservoir. Impacts to fish resident in Ross will not increase; rather, they will be lessened due to specific measures planned to facilitate access to spawning tributaries.

USDI 29 Page 48, third full para.: Earlier the EA states that the reservoirs flood 12,690 acres; here the figure is stated as 11,600. We believe 12,690 is more accurate.

USDI 30 Page 49, first full para.: Note that the use of herbicides on federal land, including land within the project boundary, requires prior approval from the National Park Service.

Page 50, para. 1, penultimate sentence: This sentence should be rewritten to state "No aquatic or terrestrial habitat adjacent to the reservoirs currently appears to be particularly important for wildlife species other than the osprey."

Pages 51, 52: See comment for page 12, bullets 1-5.

Page 52, § V.B.5, "Threatened and Endangered Species": Based on less than four pages addressing six listed species, the U.S. Fish and Wildlife Service must conclude that the Commission has not provided sufficient information to draw the conclusion, for purposes of a biological assessment under the Endangered Species Act, of "not likely to adversely affect." Although the Commission's conclusion may be correct, there is not enough information provided to logically lead to or support the conclusion. The U.S. Fish and Wildlife Service has provided this information and a list of the information needed to the Commission under separate cover.

Page 53, para. 2, sentence 2: This sentence is incorrect. The National Park Service is not aware of any "13 potential nest sites" of American Peregrine Falcon nor is the National Park Service monitoring such potential sites.

Page 53, para. 3, sentence 2: The phrase "none is near" should be replaced with "none are near". No bald eagle nests have been found in the Ross Lake corridor. However, recent sightings of an eagle pair using areas along Ross Lake during the breeding season may have changed this situation.

USDI 31 Page 57, 1st line: The statement that "recreational opportunities afforded by the SRP led to creation of the RLNRA" is not accurate. The area might have been designated a national park except for the SRP.

USDI 32 Page 63, para. 2, last sentence: This sentence should be revised to be more balanced and accurate and should read: "Thus, although many archaeological sites were inundated by SRP reservoirs, clearing vegetation from the reservoir area has aided the discovery

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-29. This EA uses the acreage figure provided by SCL.

Response USDI-30. See response to comment number USDI-4.

Response USDI-31. See response to comment number USDI-4.

Response USDI-32. Many of your editorial and factual corrections and suggestions have been incorporated. Please note, however, that material on cultural resources has been extensively reorganized and revised to reflect the current status of agreements and understandings among parties.

of prehistoric materials and the understanding of prehistoric subsistence practices in the Northern Cascades, even though over 90% of these sites have been effectively destroyed through erosion."

USDI 32 (contd)

Page 63, para. 3, sentence 2: This sentence is incorrect and should read "Of the 144 sites identified, 32 potentially meet these criteria, but required further investigation and evaluation."

Page 63, bullet 2: This bullet is a misreading of Fig. 8.29 from the 1991 survey report. A correct statement is "A majority of sites have between two and 60 artifacts, and a single site has over 20,000 artifacts."

Page 64, bullet 2: The sentence would read more accurately as: "most intensive during the middle to late Holocene Epoch (8,000 to 3,500 years ago)." As written, this sentence seems to imply that the Holocene was from 8,000 to 3,500 years ago, when in fact it is the last 10,000 years.

Page 64, last para.: We suggest re-writing this paragraph to read: "Twenty-five sites were recorded in the forested tract, five of which are historic. Four of these have above-ground structures that have been assessed as ineligible for inclusion in the National Register of Historic Places. However, these four sites have in-the-ground historic archeological remains that do require National Register evaluation. The fifth historic site has above-ground structures and archeological remains that also require evaluation."

Page 65, para. 1, sentences 2 and 3: We suggest re-writing these two sentences: "Most adverse effects in the reservoir are due to erosion, which on some landforms has removed up to eight feet of pre-reservoir deposits."

Page 65, para. 2: The National Park Service's responsibility and oversight role in the mitigation of effects to the archeological resources should be clearly acknowledged, given that the preponderance of these sites are within the NRA and that their management will reflect on the National Park Service and affect its relationship with the concerned Indian tribes.

Page 65, para. 3: Protection and stabilization should be added to the list of mitigation activities.

Page 65, para. 3: We suggest re-writing this paragraph to read: "Because erosion makes it difficult to preserve most sites along the major landforms and the shoreline, the SA emphasizes data extraction and evaluation at known sites and reconnaissance surveys to identify new sites; however, where practical and cost-effective, site stabilization may be an acceptable mitigative procedure. Thus, the anticipated adverse effects deriving from ongoing erosion and flooding would be mitigated by data retrieval, analysis and

publication or through stabilization and protection. Archaeological artifacts are a nonrenewable resource. Without the SA, this knowledge about life in and around Ross Lake would be lost to scientific and Native American communities, and the public. Also lost...."

Page 65, para. 5, and page 66, para. 1: We have not had an opportunity to review the publication cited here as "Commission 1991." Because of this, we cannot evaluate whether or not the conclusion here is warranted. The claim that "the potential for undiscovered prehistoric sites in the SRP area is low" is questionable. In response to a question regarding the Archaeological Management Plan and whether it addressed lands below the dams or just those lands behind the dams," Seattle City Light provided the following in a letter to the National Park Service dated May 27, 1993:

> "When SCL and the NPS negotiated the settlement agreement to address impacts to archaeological resources in the Project area and mitigation for those impacts, there were discussions about the potential impacts to resources in the transmission line rights-of-ways. The NPS and SCL agreed at the time that the major impacts to the archaeological resources were occurring in and around Ross Lake, as a result of the ongoing fluctuation of the lake levels. SCL agreed at an earlier date to conduct reconnaissance surveys of rights-of-way lands when certain significant ground-disturbing activities are planned. These project-specific surveys will be conducted by a qualified archaeologist before major projects are undertaken."

The National Park Service would like to supervise those surveys.

Page 66, first full para., Unavoidable Adverse Impacts: The word "slight" should be deleted for the sentence to be more accurate.

Page 66, § V.B.7.b, sentence 2: Although the National Register nomination for historic properties prepared by the National Park Service for Seattle City Light has identified these properties as eligible for the purposes of compliance with § 106 of the National Historic Preservation Act, the National Park Service has not been informed whether the nomination has actually been formally submitted for listing.

Page 67: Mention of the cultural landscape assessments, referred to above, should be made here.

Page 73, first full para.: A sentence should be added at the end: "The winter closure of State Route 20, generally from mid November to mid-April, limits access to the area and recreational use."

Page 73, second full para., sentences 3 to end: These sentences should be rewritten as follows: "The Ross Lake Resort, operating

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-33. We are unclear about the nature and status of the "cultural landscape assessments" to which you refer. However, we do not believe that omitting their mention affects our analysis. Your comment is noted.

Response USDI-34. See response to comment number USDI-4.

USDI 34 cont'd)

under a concession contract issued by the NPS, provides lodging, boat rentals, water taxi, and limited services, within the national recreation area. The old Diablo Lake Resort buildings were purchased by SCL in 1992; the land remains in federal ownership. Most of the buildings, excluding the restaurant building, will be removed and the North Cascades Environmental Learning Center will be constructed on the site. SCL will provide funding for design, construction, maintenance and operation of the facility. The Ross Lake Resort, a floating rustic resort near Ross Dam, is comprised of 14 units with possible expansion to 18 units."

Page 75, first full para., sentence 3: "Marblemount" should be added.

Page 76, bullet 7: This bullet should add the words "and eventual replacement" so as to read: "operation, maintenance, and eventual replacement of the underwater electric supply cable to the NPS campground at Colonial Creek".

USDI 35

Page 77, third full para.: Additional facilities, trails, and other developments or improvements should be listed as provided at page 15 of the Offer of Settlement.

USDI 36

Page 78: The National Park Service follows PL 93-112, The Rehabilitation Act of 1973, amended in 1978, as well as the Americans with Disabilities Act Accessibility Guidelines (ADAAG). Each project will be reviewed and ADAAG criteria will be applied. Where appropriate and feasible, projects will meet ADAAG standards. Page 84, § IX., "Finding of No Significant Impact": The Commission should revise this section so as to be a legally sufficient document, expanded in text, and the extent of public involvement, the resulting nine Settlement Agreements, and the extent to which the public interest was satisfied should be described.

Additional Comments

USDI 37

• Since the proposed action is to relicense the Skagit River Project as mitigated by the measures described in the Settlement Agreements and to implement those mitigation and enhancement measures, the EA should adequately discuss the mitigation and enhancement measures, including related construction impacts. This will provide a more comprehensive EA and may also allow expedited implementation of the mitigation and enhancement measures by minimizing the need for further environmental review.

USDI 38

• There is no reference in the EA to the cultural landscape assessments currently undergoing final revision. Visual compatibility guidelines for Newhalem (historic district) and a cultural landscape report for Ladder Creek Falls will be completed later this year and should provide guidance for such activities as "[illegible] the gravel parking lot" and improve the Switchyard and Ladder [illegible]

Letter from U.S. Department of Interior (USDI), dated April 19, 1994

Response USDI-35. See response to USDI-16.

Response USDI-36. This EA reflects possible constraints on implementation of measures for the disabled (see response to comment number SCL-26). We consider the statements and descriptions of public and agency involvement, including the Settlement Agreements, to be adequate and appropriate for an EA.

Response USDI-37. We consider that the EA does adequately describe and consider the environmental measures in the Settlement Agreements. The requirements of articles in any license order issued will implement the enhancement measures.

Response USDI-38. We note and appreciate your information on cultural landscape assessments underway; however, this level of detail is beyond the scope of the EA, which is intended to condense and summarize information. See also response to comment number USDI-32.

Falls Trail" (see page 14) as well as the consultation process referenced on page 11).

The Department thanks you for this opportunity to comment on the draft Skagit EA.

Sincerely,

For the U.S. Department
of the Interior

Barbara Scott-Brier

Barbara Scott-Brier
Attorney for the
U.S. Department of the Interior

cc: Service List

Copy

EVERGREEN LEGAL SERVICES
NATIVE AMERICAN PROJECT
101 YESLER WAY SUITE 301
SEATTLE WASHINGTON 98104

ADA SHEN JAFFE
DIRECTOR

April 14, 1994

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, NE
Washington, DC 20426

Re: Skagit River Hydroelectric Project,
Docket No. 553-005

SKAGIT RIVER TRIBES' COMMENTS ON THE FEBRUARY, 1994, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Ms. Cashell:

The following comments on the referenced Draft Environmental Assessment for New Hydropower License are submitted on behalf of the three federally recognized Indian tribal governments intervening in this docket: the Sauk-Suiattle Tribe, the Upper Skagit Tribe, and the Swinomish Indian Tribal Community.

General Comments

LS 1 The Draft Environmental Assessment uses language and reasoning which implicate certain generic issues being contested in other licensing dockets. These include: what choices can be made by the Commission when relicensing under Section 15, what constitutes the "baseline" used to determine whether there is sufficient "protection, mitigation and enhancement" of fish and wildlife resources, the difference between "mitigation" and "enhancement", mitigation for continuing harm, and-so-forth.

These issues are critical in other dockets, but not here. The choice of language used to describe the Settlement Agreements will not change the result. The protection, mitigation and enhancement provided in the agreements eliminates significant impacts and obviates the need for an Environmental Impact Statement. The Tribes are making this general comment only, to protect their legal position in other, unrelated, proceedings

Letter from Evergreen Legal Services (ELS), dated April 14, 1994

Response ELS-1. Your comment is noted.

Specific Comments

The Tribes have no specific comments at this time. However, tribal officials and staff are available to provide assistance to the Commission, should additional detail or explanation be requested regarding the impacts and solutions addressed in the Settlement Agreements. (LS 1 cntd)

Thank-you for this opportunity to comment. The Tribes appreciate the effort Commission Staff has invested in reviewing and evaluating our settlement package and trust that a licensing order, and the benefits contingent upon it, can be expected in the near future.

Sincerely,

Russell W. Busch

Russell W. Busch
Attorney for the Skagit River Tribes

Copies: Service List

NORTH CASCADES INSTITUTE

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April 15, 1994

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
825 North Capital Street, NE
Washington D.C.

Subject: Response to Draft Environmental Assessment for Skagit River Hydroelectric Project, FERC Project No. 533

Dear Sirs,

North Cascades Institute, a non profit educational organization takes this opportunity to respond to FERC's Draft Environmental Assessment for Skagit River Hydroelectric Project, FERC Project No. 533, Washington, dated February 1994.

We wish to commend the Federal Energy Regulatory Commission, Seattle City Light and all the intervenors for producing in the Settlement Agreements and the draft Environmental Assessment a series of mitigation measures that are outstanding in their scope and content.

North Cascades Institute was involved in the negotiations leading to the Settlement Agreements under the auspices of the North Cascades Conservation Council and the National Park Service. Our role was primarily in the Forums on Recreation and Wildlife, and we wish to limit our comments to those affecting the proposed North Cascades Environmental Learning Center.

NCI 1

General Comments
In the draft environmental assessment there is no statement of term for the license to be issued. The Settlement Agreement among the intervenors and Seattle City Light explicitly recognizes that the mitigation measures under the Agreement are predicated on a license term of 40 years. North Cascades Institute respectfully requests that FERC issue a license of that length.

NCI 2

p. ix The Skagit River Hydroelectric Project does not itself have beneficial effects on the environment of the North Cascades. However we feel that the environmental effects of the project are adequately mitigated by the actions undertaken in the Settlement Agreement as submitted by Seattle City Light and the intervenors.

NCI 3

Proposed Action and Alternatives:
Comments on the North Cascades Environmental Learning Center
p. 73 The Settlement Agreement specifies placement of the Environmental Learning Center on the preferred site (former site of the Diablo Lake Resort) which has been purchased by the City of Seattle. It is not stated specifically in the Settlement Agreement which of the buildings currently on the site will be removed or replaced.

Letter from North Cascades Institute (NCI), dated April 15, 1994

Response NCI-1. License periods are established in license orders. Under current policies for relicensing, it is likely that the term will be for either 30 or 40 years. See footnote No. 1 in Section VI of the final EA.

Response NCI-2. There are environmental benefits as well as enhancement measures that reduce adverse effects to the existing resources, as noted in both the draft and final EA.

Response NCI-3. This EA reflects the editorial and factual changes and suggestions in this comment.

The Environmental Learning Center will not be owned or operated solely by Seattle City Light. It will be leased and operated by North Cascades Institute under a Memorandum of Agreement (MOA) that includes prominent roles for the National Park Service (land and support services), Seattle City Light (partial funding, building construction and maintenance) and North Cascades Institute (partial funding, program, operations and administrative support). The MOA is included in the Settlement Agreements.

North Cascades Institute was asked to propose environmental education as partial mitigation of the Skagit River Hydroelectric Project by the North Cascades Conservation Council and the National Park Service.

p.76 We agree that Seattle City Light funding for the development and long term maintenance of the Environmental Learning Center is one of the most important aspects of the Settlement Agreement. Long term operation of the Center is not solely a responsibility of Seattle City Light. It is a cooperative partnership as detailed above.

The mandate for the Environmental Learning Center is regional in scope. Its existence and successful operation will serve to increase educational and recreational opportunities within the Greater North Cascades Ecosystem, including North Cascades National Park, Ross Lake National Recreation Area, and Okanogan and Mt. Baker Snoqualmie National Forests. The actions of the Environmental Learning Center will benefit the entire Skagit River Watershed and the larger landscapes of Puget Sound and the Pacific Northwest.

Finding Of No Significant Impact
North Cascades Institute supports the conclusion reached in the draft environmental assessment that the mitigation and enhancement measured contained in the Settlement Agreements adequately mitigate the environmental affects of the Skagit River Hydroelectric Project. We agree that the project with mitigation has no significant impact.

We recommend acceptance of the draft environmental assessment and issuance of a 30 year license to Seattle City Light to continue operating the Skagit River Hydroelectric Project with the recommended mitigation and enhancement measured contained in the Settlement Agreements.

Thank you for the opportunity to comment on the draft environmental assessment.

Sincerely,

Saul Weisberg
Executive Director

Letter from North Cascades Institute (NCI), dated April 15, 1994

Response NCI-4. Your comment is noted.

Response NCI-5. Your comment is noted.

Letter from U.S. Army Corps of Engineers (COE), dated April 19, 1994

Branch

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT CORPS OF ENGINEERS
P.O. BOX [illegible]
SEATTLE, WASHINGTON 98124-2255

APR 19 1994

94 APR 20 AM 9:

ORIGINAL

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capital Street N.E.
Washington, D.C. 20426

Dear Ms Cashell:

We have reviewed the draft environmental assessment (EA) for Skagit River Hydroelectric Project, FERC Project No. 553 with respect to the U.S. Army Corps of Engineers areas of special expertise and jurisdiction by law as designated by the President's Council on Environmental Quality on December 21, 1984.

The Corps of Engineers is in the early stages of a major flood control study of the Skagit River Basin. One product of the study may be recommendations for significant flood control operational changes. During the floods of 1990, some flood control operational problems surfaced that have not yet been fully resolved with Seattle City Light. In addition, Article 36 of the project license provides for up to 80,000 acre-feet of additional flood storage provided development in the lower basin makes it economically justified. The Corps of Engineers, therefore, respectfully requests that if the study or negotiations with Seattle City Light result in any significant operational changes that we be allowed to incorporate these changes in the license at a future date.

We have the following specific comments on the EA:

COE 1

III.A.1.a.8

Line 6: The top 170,000 acre-feet of the Ross reservoir storage capacity and approximately 93,000 acre feet of induced surcharge storage has been reserved for flood control usage pursuant to an agreement between SCL and the U.S. Army Corps of Engineers.

Line 14: The Corps may not, however, limit Ross Dam discharges to less than power requirements (15,600 cfs) to be re-regulated through Diablo Reservoir to a daily mean of 5,000 cfs.

III.A.1.b.10

Line 5: Suggest revise to "setting a filling schedule for Ross Lake consistent with flood control requirements."

9404220194

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APR 20 1994

Response COE-1. This EA reflects the editorial and factual corrections and suggestions in this comment.

COE 1 (cont'd)

Line 9 Suggest revision to "except during flood control regulation", [illegible] of maximum flow levels below Gorge powerhouse during

III A 3c p12

Line 19. Suggest revision to "stipulations concerning Ross Lake levels "consistent with flood control requirements."

III B p17

Line 20 Because of flood control requirements "establish year-round full pool on Ross reservoir" is not a viable alternative Storage in Ross reservoir is used to store spring and winter floods This storage helps reduce major flooding in the lower valley

V B 2 a p28

Line 18 "Although the three reservoirs have 120,000 acre-feet of flood control storage " is not correct Only Ross reservoir has the 120,000 acre-feet of flood control storage. " an agreement with the Corps of Engineers limits flood control operations to the period from October 1 to March 15 " is only partially correct Induced surcharge storage up to a maximum of approximately 95,000 acre-feet may be utilized at any time of the year to minimize flood damages.

Seattle District, Corps of Engineers staff will be in contact with you regarding these concerns in the near future. Please contact Mr Lance Meyer, (206) 764-3543 or Mr Dan Harvey (206) 764-3590 if you have questions or desire further information Thank you for the opportunity to review this statement

Sincerely,

Karen S Northup
Chief, Environmental Resources Section

94 APR 18 PM 12:

North Cascades Conservation Council

Post Office Box 95980
University Station
Seattle, Washington 98145

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

April 15, 1994

Dear Ms. Cashell:

ORIGINAL

Subject: Skagit River Hydroelectric Project, FERC No. 553 - 003

The North Cascades Conservation Council (NCCC) has received a copy of the Draft Environmental Assessment (EA) for the Skagit Hydro Project (SRP). The NCCC is especially pleased to find that the Commission staff recommends the licensing of the project with proposed enhancement measures contained in the Settlement Agreements (SA) between the City of Seattle and the intervenors.

The NCCC has been meeting and conferring with Seattle City Light (SCL) and all the other Skagit Relicensing Intervenors to collectively present, discuss, and resolve all of the issues presented in the EA. The NCCC is in agreement with all of these other parties , that the EA is essentially acceptable and should be promptly finalized with some minor revisions. Inaccuracies in the EA, noted by the NCCC, have been presented to and discussed with SCL. Since SCL also recognized the same inaccuracies in the EA and has agreed to present them to FERC, the NCCC shall not duplicate them in this communication.

There remain, however, several additional points that the NCCC wishes FERC to consider in its preparation of the Final EA.

NCCC 1 (1) Term of the license (pages 10, 11, 14, 15, 16) The mitigation measures, as described in the EA, were conceived of by the NCCC to be predicated within the specifications of license with a 30-year term.

NCCC 2 (2) Recreation (page 13) It should be recognized that the SRP really contributes directly to only a small portion of the recreational use of the Skagit area. The construction and existence of the North Cascades Highway, along with the resulting high percentage of drive-through recreational visitors, are not dependant upon the presence of the SRP. Furthermore, the Ross Lake National Recreation Area (RLNRA) was established despite the presence of the SRP. This area would have been part of the North Cascades National Park (NCNP), as was recommended in 1965 by the federal interagency study team. The opposition of SCL resulted in the establishment of the RLNRA instead. Consequently the

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APR 1 9 1994

9404200400

Lettef from North Cascades Conservation Council (NCCC), dated April 15, 1994

Response NCCC-1. Your comment is noted. See NCI-1 comment and response.

Response NCCC-2. This EA reflects the editorial and factual corrections and suggestions in this comment and comment number NCCC-3.

the National Park Service now manages the recreational resources of the RLNRA, including the reservoirs.

NCCC 3

(3) Visual Impacts (pages 57, 59) Existence of the strong visual contrast between SCL structural developments (towerline, dams, transmission corridors, roads) and the natural wild scenic resources of the surrounding mountainous Skagit area should be recognized.

NCCC 4

finally, the NCCC wishes FERC to be aware of the intimate and decisive role that the NCCC, as an intervenor, has played since 1988 in significantly altering SCL's management of its Skagit River Hydroelectric Project. The successful litigation challenge to SCL's plans to construct High Ross Dam initiated by the NCCC and joined by the Canadian Run Out The Skagit Spoilers (ROSS) has had a major impact. The resulting US-Canadian Treaty stipulated alternatives to the construction of High Ross Dam with resulting effects upon the SRP operation, as described in the EA.

The NCCC does not intend the above comments, presented for consideration by FERC, to delay FERC's prompt and early preparation of the Final EA that all of the intervenors can agree upon.

Yours sincerely,

Patrick D. Goldsworthy
Chairman of the Board, North Cascades
Conservation Council

cc: NCCC President
Fluharty
SCL

Letter from North Cascades Conservation Council (NCCC), dated April 15, 1994

Response NCCC-3. See response to comment number NCCC-2.

Response NCCC-4. Your comment is noted.

MANDELL PINDER

Barristers & Solicitors

LOUISE MANDELL *
also of the Alberta Bar
LESLIE J PINDER *
BRENDA GALBRAITH
DAVID PATERSON *
E ANN GILMOUR
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94 APR 23 AM 11:00

April 26, 1994
Our file # 55

Lois D Cashell,
Secretary
Federal Energy Regulatory commission
825 North Capitol Street, NE
Washington, DC 20426

Dear Ms Cashell

RE Skagit River Hydroelectric Project
Docket No 553-005
Nlaka'pamux Nation's comments
on the February 1994, Draft Environmental Assessment ("Draft EA")

Thank you for the opportunity to comment on the above-referenced Draft EA for the New Hydropower License We apologize for the delay in providing these comments We have specifically restricted our comments to those issues relevant to the matters on which the Nlaka'pamux Nation was granted intervention status

PINDER 1

- page 15, first bullet SCL has undertaken to formulate recommendations for the protection of TCP's in consultation with the Tribes

- page 65, 4th full paragraph the Nlaka'pamux Nation was also a signatory to a SA with SCL regarding archaeological resources

- page 70 last sentence concluding on page 71 Pursuant to the SA, an MOA between SCL and the Nlaka'pamux will be developed whereby, the Nlaka'pamux Nation will receive an initial $154,167 in three installments, three annual payments of $154,167 and a final payment of $37,499, for a total of $500,000

* PERSONAL LAW CORPORATION

Letter from Mandel Pinder (Pinder), dated April 26, 1994

Response Pinder-1. Your comment is noted. This EA contains up to date information on the Settlement Agreements and Memorandum of Agreement with the Nlaka'pamux Nation. The EA was revised to incorporate your corrections, as appropriate to level of detail and current information.

'INDER I
(contd)

• page 71, first full pa· ·raph, last sentence: Upon completion of the inventory and plan, SCL will enter into N· ·s with the Tribes that will provide for the dispensation of all remaining funds.

• page 72, second full paragraph. Once amendment has been made to include the Nlaka'pamux as a signatory to a SA with SCL regarding archaeologicalresources (see comments above regarding page 65) the word "affected" in the second line of the first sentence can be eliminated.

• page 80, first full paragraph· the word "tribes" in the 5th last line should read "Tribes".

The Nlaka'pamux Nation is grateful for the opportunity to review and comment on this Draft EA If you have any questions arising from the content of this letter, or if there is any other assistance we can provide please do not hesitate to contact the writer at your convenience

Yours truly,

MANDELL PINDER

Brenda Gaertner
Barrister & Solicitor

CC SERVICE LIST

BGAns

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
911 NE 11th Avenue Room 620
PORTLAND OREGON 97232
503 230 5400 FAX 503 230 5435

COPY

APR 19 4 10: 2

APR 14 1994

F/NWO3

Ms. Lois Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Re: Draft Environmental Assessment for the Skagit Hydroelectric Project (FERC No. 553)

Dear Ms. Cashell:

The National Marine Fisheries Service (NMFS) appreciates the opportunity to review the Federal Energy Regulatory Commission (FERC) document entitled, "Draft Environmental Assessment For New Hydropower License Skagit River Hydroelectric Project FERC Project N. 553."

General Comments

NMFS is extremely pleased that FERC has accepted the Offer of Settlement and supporting settlement agreements (SA) filed by Seattle City Light and the settlement parties in the Draft Environmental Assessment (DEA).

NMFS 1

Specific Comments

NMFS concurs with the Tribes, other fisheries agencies, and Seattle City Light that factual corrections are needed in the DEA. When these corrections are made, NMFS will be in full support of the Environmental Assessment and relicensing the Skagit River Project at the earliest possible date under the conditions of the SA.

If you have any questions regarding this response, please contact Mr. Jon Linvog, of my staff, (206) 526-6120.

Sincerely,

Merritt E. Tuttle
Division Chief

cc: Service List

Letter from National Marine Fisheries Service (NMFS), dated April 14, 1994

Response NMFS-1. Your comment is noted.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3704 Griffin Lane SE Suite 102
Olympia Washington 98501 2192
(206) 753-9440 FAX (206) 753 9008

April 19. 1994

John Clements. Acting Director
Division of Project Review
Federal Energy Regulatory Commission
825 North Capitol Street. N E
Washington. D C 20426

Reference: Skagit River Project. #553.

Dear Mr Clements

The Fish and Wildlife Service (Service) recently received the Draft Environmental Assessment (DEA) for the proposed action of relicensing the Skagit River Project We subsequently received a letter from Dean Shumway. former Director of your Division. regarding the possible occurrence of federally listed threatened and endangered species in the project vicinity Mr Shumway indicated that the DEA addresses the project's effects on these species and concludes that the project. with the FERC recommended measures is "not likely to adversely affect" and asked for our concurrence

FWS 1 The DEA. under NEPA. is essentially an internal document intended to determine whether the proposed federal action might significantly affect the quality of the human environment. and therefore. whether an Environmental Impact Statement must be prepared. The DEA is dependent on volumes of supporting documentation. The section on threatened and endangered species may be sufficient for FERC's internal needs. but it falls short of the requirements of a Biologica Assessment under the Endangered Species Act. For example. the section on grizzly bears is comprised of only three sentences. and the entire endangered species section is less than four pages covering six listed species. Large volume does not equate with sufficiency. but potential impacts and mitigative actions should be specifically described An assessment should describe any potential project-induced impacts to the listed species. how the Wildlife Mitigation Plan or other actions offset any identified impacts and an analysis sufficient to document the assessment The Biological Assessment in itself. should logically lead to. and support the conclusion made by FERC

Letter from U.S. Fish and Wildlife Service (FWS), dated April 19, 1994

Response FWS-1. This EA includes a Biological Assessment as an appendix, which is cited in the main text. This Biological Assessment was provided to you separately for review. Your concurrence with the Biological Assessment is noted.

FWS 1 (contd)

The Service cannot concur with FERC s conclusion of "not likely to adversely affect" without a sufficient Biological Assessment Our document Biological Assessment Preparation And Review, is enclosed for your use For further information or consultation on this issue please contact Steve Fransen at the letterhead address or telephone

Sincerely,

for Nancy J Gloman

David C. Frederick
State Supervisor

sf/jmc
Enclosure
FERC 553/Skagit

APPENDIX B. FLOW REGULATIONS PROPOSED TO CONTINUE FOR PROTECTION OF ANADROMOUS FISHERY RESOURCES IN THE SKAGIT RIVER DOWNSTREAM OF THE SRP

Appendix B. Flow Regulations Proposed to Continue for Protection of Anadromous Fishery Resources in the Skagit River Downstream of the SRP.

These are the current conditions as determined under interim agreements between SCL and the resource agencies. Reproduced from the Fisheries Agreement of the Offer of Settlement (SCL 1991b). Referenced appendices are those in the Fisheries Agreement.

6.3 FLOW REGULATION

6.3.1 General

The Parties agree that continual provision of adequate instream flows and continued adherence to operating parameters and guidelines are essential for the protection and improvement of anadromous fish habitat and fish production in the Skagit River. Where minimum flows required for incubation and fry protection for the various species of anadromous salmon or steelhead spawning groups overlap in time, the City shall provide the highest minimum flow indicated on any particular day.

6.3.2 Flow Regulation For Salmon

The City shall provide instream flow and limit operations to protect salmon as indicated below.

6.3.2.1 Salmon Redd Protection

Subject to the exception for Insufficient Months as determined pursuant to Section 6.4 (Flow Insufficiency), the City shall regulate spawning and incubation flows to provide protection of salmon redds and offspring as indicated below.

(1) Salmon Spawning and Incubation Periods

(a) Salmon Spawning Periods The spawning periods for salmon are defined as follows unless these periods are optionally modified pursuant to Appendix J (Alternative Salmon Spawning Periods). The spawning period of chinook salmon shall start at 0001 hours on August 20 and shall end at 2400 hours on October 15 each year. The spawning period of pink salmon, which occurs only in odd numbered years, shall start at 0001 hours on September 12 and shall end at 2400 hours on October 31 each year. The spawning period of chum salmon shall start at 0001 hours on November 16 and shall end at 2400 hours on January 6 each year.

(b) Salmon Incubation Period Incubation periods shall start at 0001 hours on the first day of the spawning period and shall end at 2400 hours on April 30 for chinook and pink salmon and on May 31 for chum salmon.

(2) Salmon Spawning Flow

During the spawning period of each salmon species, Daily Spawning Flows shall not exceed 4,500 cfs for chinook salmon, 4,000 cfs for pink salmon, and 4,600 cfs for chum salmon unless (a) the flow forecast made by the City shows a sufficient volume of water will be available to sustain a higher incubation flow, thereby permitting a higher spawning flow (see Appendix C Salmon Spawning/Incubation Flow Tables), or (b) uncontrollable flow conditions are present, as described in Sections 6.4 and 6.5.

The Season Spawning Flow for each species shall be defined as the average of the highest ten (10) Daily Spawning Flows at the Newhalem gage during the spawning period of that species. Daily Spawning Flows shall be calculated as shown in Appendix A, Part 1 (General Calculation of Daily Spawning Flow). A sample calculation of Season Spawning Flow is shown in Appendix A, Part 2.

(3) Salmon Incubation Flow

The City shall provide instantaneous minimum incubation flows for each day of the incubation period of each species, as follows, unless higher minimum flows are required as specified under Section 6.3.1 (General Provisions of Flow Regulation).

(a) Salmon Incubation Flow During the Spawning Period Incubation flow during the first ten (10) days of the spawning period of each species shall be based on the Planned Spawning Flow. After the first ten days, incubation flow for each species shall be based on the average of the highest ten (10) Daily Spawning Flows that have occurred up to that day during the spawning period. For example, the incubation flow for the twentieth day of the spawning period is based on the average of the highest ten (10) Daily Spawning Flows during the preceding 19 days, and so on for the twenty-first, twenty-second, etc. days.

Appropriate incubation flows shall be determined for the spawning flows that are calculated as described above according to Appendix C (Salmon Spawning/Incubation Flow Tables). Sample calculations are shown in Appendix B, Parts 1 and 2.

(b) Salmon Incubation Flow Following the Spawning Period Incubation flow during days following the spawning period of each species shall be based on the Season Spawning Flow which is calculated as the average of the highest ten (10) Daily Spawning Flows at the Newhalem gage during the spawning period of that species. Appropriate incubation flows shall be determined for the Season Spawning Flow according to Appendix C (Salmon Spawning/Incubation Flow Tables). A sample calculation is shown in Appendix B, Part 3.

6.3.2.2 Salmon Fry Protection

During the period from 0001 hours on February 1 through 2400 hours on May 31 when salmon fry are emerging from redds, which shall be known as the Salmon Fry Protection Period, the City

shall implement the following restrictions of downramp conditions and minimum flow for the purpose of protecting salmon fry.

(1) Downramp Amplitude During Salmon Fry Protection Period The City shall limit the Downramp Amplitude to no more than 4,000 cfs.

(2) Downramping During Salmon Fry Protection Period The City shall restrict its maximum downramping rate, as measured at Newhalem gage, to protect salmon fry as follows:

(a) Daytime Downramping During the Salmon Fry Protection Period During the period of time beginning six and one-half hours prior to official sunrise and ending at official sunset (Pacific Standard or Pacific Daylight Time), no downramping is allowed from the moment when Predicted Marblemount Flow is less than or equal to 4,700 cfs. Downramping may proceed at a rate of up to 1,500 cfs per hour as long as Predicted Marblemount Flow is greater than 4,700 cfs

(b) Nighttime Downramping During the Salmon Fry Protection Period Downramping is allowed at a rate up to 3,000 cfs per hour during all periods other than daytime.

(3) Salmon Fry Protection Flow Subject to the exception for Insufficient Months as determined in Section 6.4 (Flow Insufficiency), the City shall maintain a minimum flow at the Newhalem gage that is the higher of either the flow that results in a Predicted Marblemount Flow of at least 3,000 cfs or the monthly flows as set forth in Appendix I (Fry Protection Flows At Newhalem gage). For the purpose of salmon fry protection, the City shall not be required to release flows (as measured at Newhalem gage) greater than 2,600 cfs. Sample calculations are included in Appendix D, Parts 1, 2, and 3.

6.3.3 Steelhead

The City shall provide instream flows and limit operations to protect steelhead as indicated below:

6.3.3.1 Steelhead Redd Protection

Subject to the exception for Insufficient Months as determined pursuant to Section 6.4 (Flow Insufficiency), the City shall regulate spawning and incubation flows to protect steelhead redds and offspring as indicated below.

(1) Steelhead Spawning and Incubation Periods

(a) Steelhead Spawning Periods The steelhead spawning period shall be March 15 through June 15 each year. This total spawning period shall be divided into three subperiods which correspond to the months, or portions thereof: March 15 31, April 1 30, and May 1 through June 15 which shall be treated as separate spawning groups for the purpose of determining succeeding steelhead incubation flows.

The spawning subperiod of March steelhead shall start at 0001 hours on March 15 and shall end at 2400 hours on March 31. The spawning subperiod of April steelhead shall start at 0001 hours on April 1 and shall end at 2400 hours on April 30. The spawning subperiod of May and June steelhead shall start at 0001 hours on May 1 and shall end at 2400 hours on June 15.

(b) Steelhead Incubation Period The incubation periods for each spawning group shall start at 0001 hours on the first day of the spawning subperiods and shall end at 2400 on June 30 for March steelhead, and July 31 for both April steelhead and May through June 15 steelhead. During the month of August minimum flows of 2,000 cfs will be maintained for fry protection purposes as described in Section 6.3.3.1.(3)(b).

(2) Steelhead Planned Spawning Flow

During the steelhead spawning period, Planned Spawning Flows shall not exceed the flows indicated by the most current Spawning Control Curve, which is determined as shown in Appendix E (Shaping of Flows During Steelhead Spawning). Further, to the extent Ross Lake has sufficient storage volume to contain and shape the forecast runoff without causing spill, Planned Spawning Flows shall be less than the following amounts: 5,000 cfs for March steelhead, 5,000 cfs for April steelhead, and 4,000 for May. through June 15 steelhead, unless the forecasted inflow and storage is great enough to provide incubation flows for higher Season Spawning Flows. Any Planned Spawning Flows greater than the flow ranges above shall not be implemented prior to discussion in the FCC. Spawning flows shall be shaped such that they result in reservoir elevations greater than or equal to the Spawning Control Curve and less than the Spill Control Curve as described in Appendix E. The City shall endeavor to provide uniform Season Spawning Flows over the entire spawning period as described in Appendix E.

The actual Season Spawning Flow for each subperiod shall be defined as the average of the highest ten (10) Daily Spawning Flows at the Newhalem gage during each spawning subperiod. Daily Spawning Flow shall be calculated as shown in Appendix A, Part 1 (Calculation of Spawning Flow).

(3) Steelhead Incubation Flow

The City shall provide instantaneous minimum incubation flow for each day of the incubation period of steelhead, as follows, unless higher minimum flows are required as specified under Section 6.3.1:

(a) Steelhead Incubation Flow During the Spawning Subperiods Incubation flow during the first ten (10) days of each spawning subperiod shall be based on the Planned Spawning Flow. Thereafter, daily incubation flows shall be based on the average of the highest ten (10) Daily Spawning Flows that have occurred up to that day. Appropriate incubation flows for any given day shall be determined for the spawning flows that are calculated as described above and the Season Spawning Flows according to Appendix G (Steelhead Spawning/Incubation Flow Tables). Sample calculations are shown in Appendix F, Parts 1 and 2.

(b) Steelhead Incubation Flow Following the Spawning Subperiods Incubation flow during days following each spawning subperiod shall be based on the Season Spawning Flow which shall be calculated as the average of the highest ten (10) Daily Spawning Flows during that subperiod. Appropriate incubation flows for any given day shall be determined by the Season Spawning Flows according to Appendix G. A sample calculation is shown in Appendix F, Part 3.

During the months of June and July, the City shall maintain daily incubation flows at Newhalem gage, at least as great as the monthly minimum fry protection flows set forth in Appendix I, that result in Predicted Marblemount Flows no less than the flows listed in Appendix G which correspond to the appropriate Season Spawning Flows. A sample calculation is shown in Appendix F, Part 3. For the purposes of incubation, the City shall not be required to release flows (as measured at Newhalem gage) greater than 2,600 cfs. During the month of August, the City shall maintain instantaneous daily incubation flows at Newhalem gage of 2,000 cfs, except that when Natural Flow on the Inflow Day is less than 2,300 cfs, the minimum incubation flow may be reduced to 1.500 cfs until the Natural Flow exceeds 2,300 cfs.

6.3.3.2 Steelhead Fry Protection

During the Steelhead Fry Protection Period from 0001 hours on June 1 through 2400 hours on October 15, unless modified pursuant to Appendix K (Alterative Steelhead Fry Protection Period), the City shall implement the following restrictions on downramp conditions and minimum flow for the purpose of protecting steelhead fry.

(1) Downramp Amplitude During the Steelhead Fry Protection Period Maximum 24 hour Downramp Amplitude shall be limited to 3,000 cfs, except that when Section 6.4 (Flow Insufficiency) flow reductions are in effect, the maximum 24 hour Downramp Amplitude for August shall be limited to 500 cfs. From the point that flow at Newhalem gage is 4,000 cfs or less, the Downramp Amplitude is further limited regardless of whether the maximum 24 hour amplitude can be attained. A sample calculation is shown in Appendix H, Parts 1, 2, and 3.

(2) Downramping During the Steelhead Fry Protection Period The City shall restrict its maximum downramping rate, as measured at Newhalem gage, to protect steelhead fry as follows:

(a) Newhalem Instantaneous Flow 4,000 cfs or Less Downramping is allowed up to 500 cfs per hour.

(b) Newhalem Instantaneous Flow Above 4,000 cfs Downramping is allowed up to 1,000 cfs per hour.

(3) Steelhead Fry Protection Flow--Subject to the exception for Insufficient Months as determined in Section 6.4 (Flow Insufficiency), the City shall maintain minimum flows at Newhalem gage which are the higher of flows specified in Appendix I (Fry

Protection Flows at Newhalem Gage) or determined by Section 6.3.3.1 (Incubation Flows). During the portions of June and October excluded from the Steelhead Fry Protection Period pursuant to Appendix K (Alternative Steelhead Fry Protection Period), minimum flows shall be determined by Section 6.3.3.1 (Incubation Flow). Further, the minimum flow for August may be reduced to 1,500 cfs when Natural Flow at Newhalem gage on the Inflow Day is less than 2,300 cfs.

APPENDIX C. ENDANGERED SPECIES ACT BIOLOGICAL ASSESSMENT, SKAGIT RIVER PROJECT

~~(See attached APPENDIX C on the hard copy.)~~

Endangered Species Act

Biological Assessment

Seattle City Light
Skagit River Project No. 553
Whatcom County, Washington

May 1994

Federal Energy Regulatory Commission
Washington, D.C.

BIOLOGICAL ASSESSMENT FOR THREATENED AND ENDANGERED SPECIES FOR THE SKAGIT RIVER PROJECT (FERC NO. 553)

INTRODUCTION AND PROJECT DESCRIPTION

In April 1991, various parties, including the U.S. Fish and Wildlife Service (FWS), presented to the Federal Energy Regulatory Commission (Commission) an Offer of Settlement for relicensing the Skagit River Project (SRP) in Whatcom County, Washington. The Settlement Agreement (SA) included a number of individual settlement agreements and supporting reports filed in 1991 and 1993 on fisheries, wildlife, erosion control, cultural resources, recreation and aesthetics, and traditional cultural properties. The parties, including the FWS, consider the SA to " . . . resolve all issues for the period specified in each agreement related to the effects of the project, as currently constructed, upon the subject areas identified above." Relicensing the SRP under the terms of the SA constitutes the proposed action that was evaluated in the draft environmental assessment (EA) issued on March 3, 1994. The enclosed figures 1 and 2 show the locations of reservoirs and project facilities.

Under the proposed action, the SRP would continue to operate as it has during recent years. No new construction would occur in areas where facilities are not currently present. Repairs, renovations, or upgrades of various existing facilities identified in Sect. III.A.3 of the EA would be conducted, but would be unlikely to affect a significant amount of land area. The enhancements include:

1. Erosion control measures at 37 project-related sites and 18 road sites;
2. Reservoir filling schedules and flow releases to protect resident and migratory fish;
3. Acquisition of wildlife habitat parcels, with parcel management subject to approval of the Wildlife Management Review Committee;
4. Visual enhancements to project facilities;
5. Enhancements for cultural resources; and
6. Improvements in land use and recreation opportunities.

The SA activity that could affect the largest land area would be the management of the approximately 3,985-acre riparian corridor planned for acquisition. This corridor is located along the South Fork of the Nooksack River in T36N, R6E and T36N, R7E. It is currently owned by the Crown Pacific Company and is a major part of one of the most important elk and deer winter ranges in this part of the state. Also, some anadromous fish occur in the river in the lower portion of the corridor.

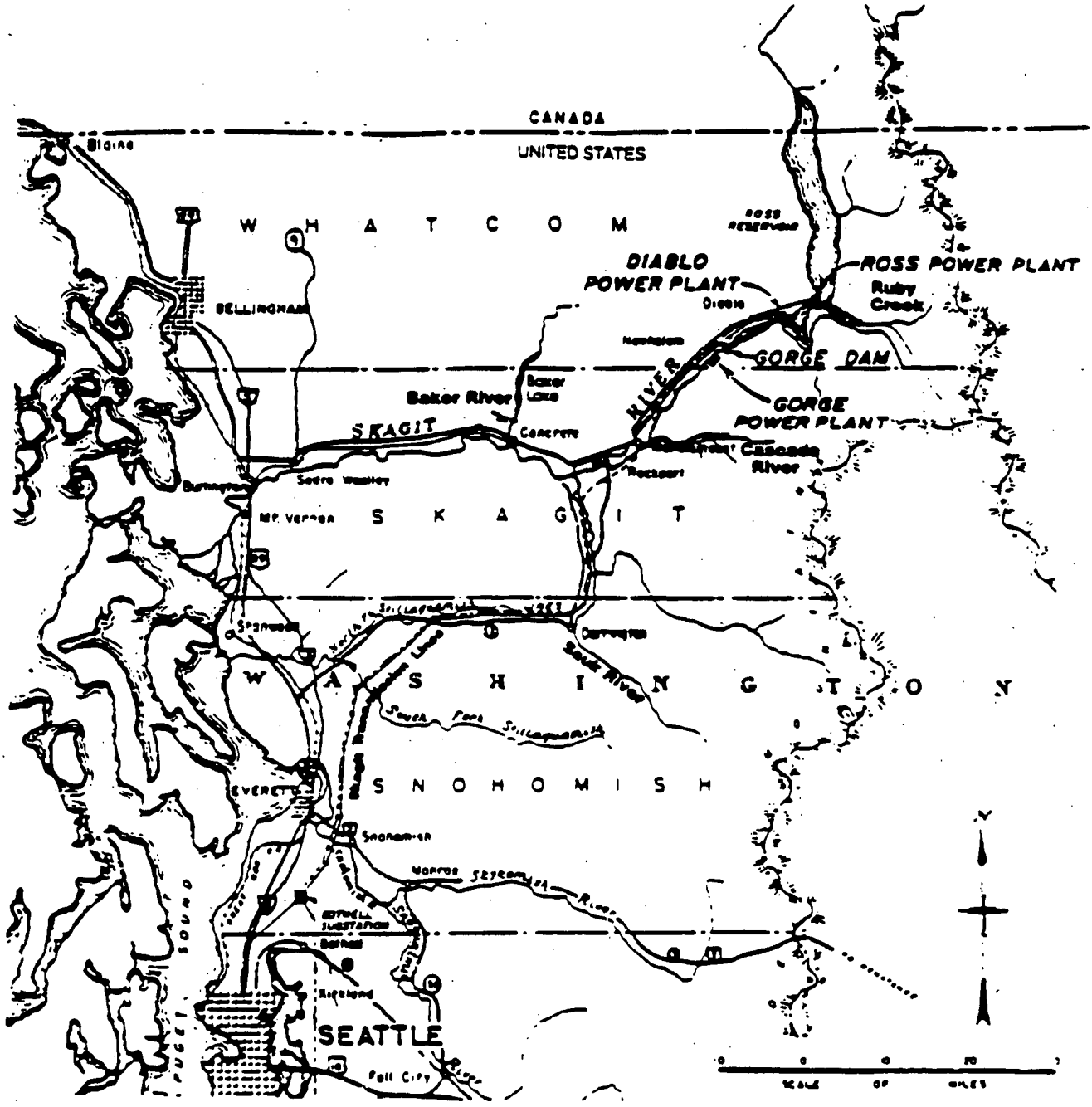

Figure 1. Location and selected features of the Skagit River Basin and surrounding region, including the Ross, Diablo, and Gorge dams and reservoirs of the Skagit River Project. (Source: The staff.)

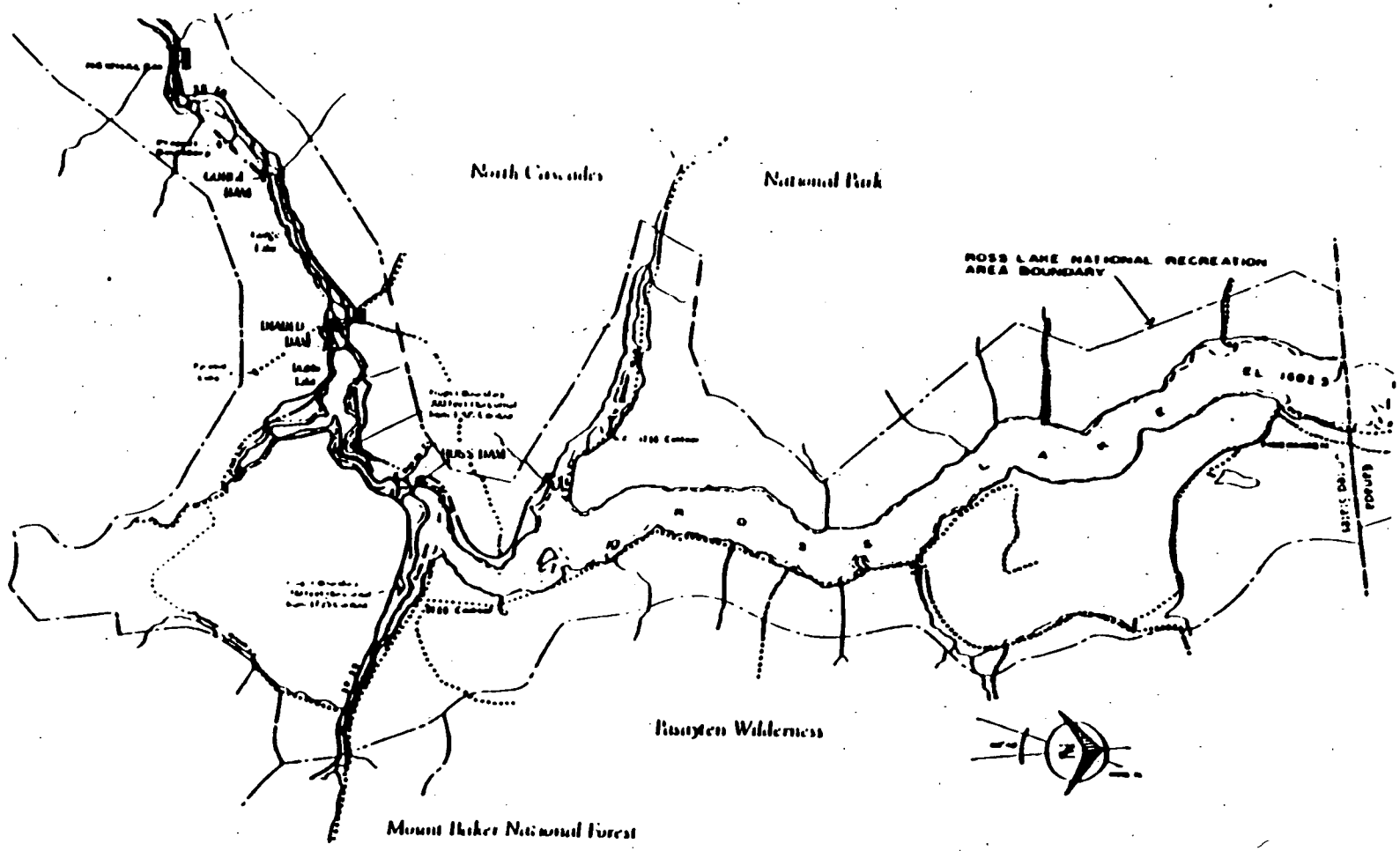

Figure 2. The Skagit River Project and major project features. (Source: The staff.)

The corridor is forested primarily with mixed communities of conifer and broadleaf trees and communities of broadleaf trees approximately 60-100 years of age. Most pockets of pure conifer trees have been logged in the last 5-20 years, yielding approximately 15-25% openings distributed along the entire length of the corridor. The corridor also has flat benches that are periodically flooded, with a few sloughs and wetlands. Management of this acreage would involve the maintenance of existing clearcuts and possibly the creation of several more small clearcuts of 20 acres each to provide forage for elk. About 5-20% of the area would be maintained in grass-forb communities. Riparian buffers of trees would be re-established where they were removed in the past by logging.

ECOLOGICAL DESCRIPTION AND POTENTIAL IMPACTS OF THE PROPOSED ACTION

No threatened or endangered plant species listed by the FWS is known to occur in the state of Washington (50 CFR 17.12). SCL conducted a survey for rare plants in powerline corridors from Ross Dam downstream to Bacon Creek, but no such plants were found (Section V.B.3). Therefore the proposed action should have no impact on any threatened or endangered plant species.

Several wildlife species listed by the FWS as threatened or endangered may occur on or near the reservoirs and power lines of the SRP (Frederick 1992), including the northern spotted owl (threatened), bald eagle (threatened), marbled murrelet (threatened), grizzly bear (threatened), and gray wolf (endangered). The ecology of these species in the basin was discussed in Commission (1991). Some of these species may currently have limited population levels because the reservoirs occupy formerly terrestrial habitats. Owls, eagles, and murrelets may have collided with SRP powerlines, although no collisions have been reported.

Also, the bald eagle may be indirectly affected by any effects of the SRP on anadromous fish, on which eagles feed. No specific case has been identified where the SRP is causing problems for any listed species, and continued operation of the SRP would not likely cause any new direct or indirect impact on listed species or their habitats. The following paragraphs provide more detailed SRP-specific information and assessment of existing conditions and potential impacts for each animal species. In addition, the peregrine falcon (endangered), which is currently absent as a nesting bird but may nest in the area in the future, is discussed.

Certain aspects of the proposed action under the SA are unknown. These include the specific parcels of land to be acquired and the specific management plans to be developed for

each acquired land parcel. Because these aspects are unknown, their potential effects on wildlife are also unknown to some extent. In general, however, the habitat acquisitions and management plans are expected to be beneficial. Moreover, the FWS and the National Park Service (NPS) will have review authority to approve or disapprove of acquisitions and management to ensure that significant effects do not occur to important resources such as threatened and endangered species.

American Peregrine Falcon

The peregrine falcon (endangered) has begun to recover from population declines caused by pesticide contamination and has reoccupied at least 16 nesting sites in Washington. The falcon has been sighted often in the North Cascades but is not known to nest in the vicinity of the proposed project sites. It typically nests on cliffs higher than 150 feet that are near water bodies where the peregrine can find suitable avian prey. Important foraging areas include riverine and riparian habitats, lakes, and marshes. As of 1988, only one active peregrine nest site had been located in the North Cascades (SCL 1989).

No active nest sites are located in North Cascades National Park (NCNP) or Ross Lake National Recreation Area (RLNRA). According to a SCL response to an additional information request (AIR) from FERC (SCL 1989, p. 7-5), 13 potential peregrine falcon nest sites are present in the park and are being monitored by the NPS, and peregrines of unknown breeding status are occasionally seen near these sites; SCL reported that this information was obtained from a wildlife biologist employed by the NPS. However, the U.S. Department of the Interior (USDI), in a letter commenting on the draft EA, states that the NPS is not aware of and is not monitoring any potential peregrine falcon nest sites in the park (Scott-Brier 1994). Nesting near the reservoirs is probably unlikely, because the most attractive sites as reported by SCL are located at higher elevations (SCL 1989).

The proposed action as summarized above and as described in more detail in the EA is not likely to adversely affect the peregrine falcon. Neither potential nest sites nor other areas where the peregrine falcon may occasionally occur in the RLNRA would be significantly and adversely affected by the proposed activities under the SA. Habitat management in the riparian corridor is not expected to occur in or near any important peregrine falcon habitat.

Bald Eagle

After being greatly reduced by pesticide contamination, populations of nesting bald eagles in Washington are increasing. Although most nests are located in the coastal region, several eagle pairs nest in the Skagit River Basin. The estimated number

of nesting eagle pairs in Washington is 398, annually producing an average of 1.06 young birds per pair (Kjos 1992). The eagle, federally listed as threatened in Washington (50 CFR 17.11), also occurs in large numbers during the winter along the Nooksack, Skagit, Sauk, Suiattle, and Skykomish rivers (USFS 1990b). The concentration of wintering eagles in the Skagit River Basin is one of the largest in the United States. In the basin, the eagle feeds primarily on carcasses of anadromous fish that migrated up the river to spawn [Beak Consultants Incorporated (BCI) 1990]. Carcasses washed up on gravel bars are readily available to eagles.

Surveys on the Skagit River have found as many as 450 overwintering eagles, most of which nest in Canada and Alaska. High concentrations usually occur during the period from October through March, with peak numbers occurring between Rockport and Newhalem and coinciding with chum salmon migration during January and February. These overwintering eagles feed primarily along the larger rivers in the basin; few eagles forage along creeks, where natural barriers are often present and preclude migration of anadromous fish into these areas.

Severe flooding on the Skagit River during winter months can wash away salmon carcasses on which eagles feed, resulting in significant departure of eagles from the area. Severe flooding in the winter of 1989-1990 apparently caused eagle numbers along the Skagit River to decrease from about 250 birds to about 75 (BCI 1990). Birds leaving the area may fly to other nearby rivers that usually support large numbers of overwintering eagles.

Four nest sites are known in the Skagit River Basin, but none is near the SRP. However, recent sightings of a pair of bald eagles along Ross Lake during the breeding season indicate that a nest may be present (Scott-Brier 1994).

Communal roost sites, to which wintering eagles flock to spend the night, are also present in the basin. At any given time, the number of eagles using each roost site is dependent on the number of eagles overwintering in the basin. Roost sites with relatively large numbers of eagles tend to be used in most years if not every year, whereas roosts with smaller eagle numbers may not always be used. Roost locations may thus shift seasonally and annually in response to prey availability and other factors (SCL 1989). Five roost sites have been identified in the Skagit River Basin downstream from Rockport (BCI 1990). Ten sites have been located along the Skagit River between Rockport and Bacon Creek, which is about 11 miles downstream from the SRP (SCL 1989). Additional roosts are suspected to exist within these areas.

A forest stand that serves as a roost site typically has

old-growth trees and small trees, such that the stand is well-stratified or multilayered. Within the roost site, eagles tend to select the larger-than-average trees for roosting (Anthony et al. 1982). The fraction of eagles that roost overnight in communal roosts, as opposed to roosting individually, is not known but appears to be higher during more inclement weather.

Bald eagles appear relatively susceptible to collision with powerlines, but they are not known to have collided with lines in the Skagit River Basin and are persisting well despite the presence of project transmission lines.

The presence of the reservoirs limits the amount of riverine habitat available to eagles, and Gorge dam operation dewaters the 2 miles of Skagit River between the Gorge dam and Newhalem. The operation of the SRP also alters downstream river flows.

SCL (1989) addressed the effect of altered Skagit River flow on eagles downstream of the SRP. High flows, which included very high peak flows before SRP construction, can reduce salmon reproductive success and sweep salmon carcasses away from gravel bars, thus decreasing salmon availability to eagles. Beginning in 1981, flow fluctuations were controlled to minimize impacts on salmon reproduction. Additional control was begun in 1984, which further increased flow stability. Controls are applied November 15-January 6 to approximate the salmon spawning season. Although greater flows below the Gorge dam after January 6 may wash carcasses away from gravel bars, these flows are generally smaller than those naturally occurring prior to the SRP.

The SCL study addressed the abundance of salmon and overwintering eagles along the Skagit River from Rockport to Marblemount to Newhalem before and after establishment of the 1984 flow controls. Eagle populations in this area had been systematically surveyed by the Nature Conservancy and NPS since 1977, including at least one count per week from early December to early March. The Washington Department of Fisheries had determined annual salmon abundance based on systematic surveys of Skagit River populations. Eagle and salmon populations were highly variable annually and after 1984 were not statistically different from those before 1984. However, the data suggested an increase in salmon and eagles from 1983 to 1988, and any future surveys may demonstrate a statistically significant increase (SCL 1989).

The annual maximum number of eagles present between Rockport and Marblemount was highly correlated with annual chum salmon abundance but reached an overall maximum (asymptote) beyond which no further increase occurred even when salmon abundance increased to very high levels. This correlation is consistent with results shown by studies of eagles on other river systems in the Pacific Northwest. No significant correlation between eagles and chum

salmon existed between Marblemount and Newhalem, possibly because data on salmon in this area were less complete. Also, eagles may have a more varied food supply in this river reach, where they are believed to feed frequently on coho as well as chum salmon (SCL 1989). Thus, the data reported by SCL (1989) indicate that SRP operation has stabilized flows in the Skagit River and has not caused significant adverse impacts to bald eagles.

The proposed action as summarized above and as described in more detail in the EA is not likely to adversely affect the bald eagle. Releases from the SRP reservoirs and downstream flows would be controlled under the SA to provide benefits for anadromous fish. Therefore, bald eagles may also be benefitted. If the pair of bald eagles that has been seen nests somewhere in the RLNRA, it is unlikely that the nest area and the bald eagles would be adversely affected, because construction activities in RLNRA would occur only at existing sites (e.g., boat ramps, campground).

The exact locations of the riparian corridor land acquisitions and possible clearcutting have not been finalized. However, only 5-20% of the area would be maintained in clearings, and most of this acreage would be in areas logged during the last few decades. Because only a small fraction of the corridor would be actively managed, SCL and the parties to the SA should be able to accomplish this active management without having any significant impact on any bald eagles that may be using the area. The FWS, as a party to the SA, will be consulted before any land acquisitions and during development of habitat management plans. This consultation and planning should ensure protection of the bald eagle.

Although bald eagles could collide with SRP power lines, such collisions are believed to occur so infrequently that bald eagle populations are not likely to be adversely affected. Eagles would not be electrocuted by the SRP power lines because the lines are too large (230-kiloVolt). The 230-kV lines have wires and grounds that are too far apart for eagles to simultaneously touch.

Northern Spotted Owl

The northern spotted owl is listed as threatened by the FWS (FR 55, No. 123, p. 26114, June 26, 1990) and occurs primarily in mature and old-growth forest below 4,000 feet above mean sea level. The FWS has designated portions of the basin as spotted owl critical habitat, none of which is located in the RLNRA (Mulder 1992).

The Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl identified a system of habitat conservation areas (HCAs) and recommended that no timber

harvest be conducted in these areas (Thomas et al. 1990). Currently, the USFS and the Bureau of Land Management (BLM) are not harvesting timber in these HCAs, but they have not made final decisions on long-term timber harvest policy. The draft recovery plan for the spotted owl recommends owl protection within designated conservation areas (DCAs), which are similar to the HCAs. Final decisions on owl protection in these areas will be affected by policy decisions of the agencies responsible for management of the affected lands (FR 57, No. 191, p. 45328-37, October 1, 1992).

The RLNRA, in which no spotted owls are known to nest, includes a portion of one DCA designated as WD-34 (FWS 1992). This DCA has a total area of 87,698 acres in which spotted owls have been observed occasionally but has no known pairs of nesting spotted owls. Based on knowledge of habitats, the FWS (1992) believes that 7 pairs of owls currently nest in the DCA and that, with conservation measures, 10 pairs of nesting spotted owls will eventually inhabit the DCA.

The presence of the SRP reservoirs probably limits owl populations in the area to some extent by precluding development of additional old growth habitat. Formal management plans for spotted owl habitat on lands of the FS and BLM, as specified in the report of the Forest Ecosystem Management Assessment Team (FEMAT 1993), become effective May 21, 1994, although these plans do not affect the RLNRA.

The spotted owl's range extends from southwestern British Columbia through western Washington, western Oregon, and the Coast Ranges area of northwestern California south to San Francisco Bay. Approximately 2,000 spotted owl pairs have been counted, although the total population is thought to include perhaps 3,000 to 5,000 pairs (Anon. 1990a). Degradation and loss of habitat, primarily from timber harvest, are the major reasons for the decline of this species (Thomas et al. 1990; Carey et al. 1992).

Spotted owl pairs have home ranges sometimes exceeding 10,000 acres but usually remain within the home range the entire year. During the nonbreeding season, however, some adults may temporarily move to other areas as far as 20 miles away. Young owls leave the nest area during late summer and fall, often dispersing many miles from the nest area (as great a distance as 62 miles has been reported). The most important food of the spotted owl appears to be arboreal and semi-arboreal mammals such as the flying squirrel and woodrat (Forsman and Meslow 1986).

The proposed action as summarized above and as described in more detail in the EA is not likely to adversely affect the northern spotted owl. The construction activity associated with upgrades of existing facilities in the RLNRA would affect only a

very small area of forest and would thus be unlikely to adversely affect the owl. Also, it is unlikely that any nest site or particularly important roosting or foraging habitat would be damaged by the activities at these existing facilities. In the riparian corridor, no old-growth coniferous forest would be affected by habitat management activities to promote elk and deer winter range, and only a small fraction of the corridor would be actively managed. Thus, sufficient undisturbed area would be available to ensure adequate protection of owl nesting, roosting, and foraging activities.

Marbled Murrelet

The marbled murrelet is a small, robin-sized seabird that feeds at sea and nests in coastal and inland areas from Alaska to California. In inland areas in the Pacific Northwest, the murrelet nests in old-growth coniferous forests. The FWS has federally listed this species as threatened in Washington, Oregon, and California. The maximum breeding population in Washington is estimated to be 5,000 birds (FR 57, No. 191, p. 45328-37, October 1, 1992).

Although murrelets occur in inland areas mainly during the nesting season from about May to August, they also occur inland in all other months when they may roost overnight in forests. Their occurrence inland is strongly associated with old-growth coniferous forest. In Washington, murrelets occur more frequently when old-growth and mature forests make up more than 30 percent of the landscape (Hamer and Cummins 1990). Inland, they are observed almost exclusively within an hour or two of sunrise and sunset, when they fly between inland sites and the ocean or when they circle over nesting or roosting areas in old-growth forest. Most observations (e.g., 85 percent) are of single birds and pairs rather than of flocks. Although most murrelet observations have been within 12 miles of the coast, some have been about 50 miles inland (Paton et al. 1990). Gorge Dam and Ross Dam are about 55 and 65 miles, respectively, from marine environments.

As of January 1990, four nests had been found and described in North America, and 3 had been found in Asia, according to Paton and Ralph (1990). As of 1992, 23 tree nests had been found in North America, including five in Washington (FR 57, No. 191, p. 45328-37, October 1, 1992). Although murrelets apparently often nest solitarily rather than in colonies (Eisenhawer and Reimchen 1990), they appear to be semi-colonial. Evidence for semi-colonial nesting includes two nests found 150 feet apart (Hamer and Cummins 1990), the finding of two young (each female lays only one egg) at each of 3 sites (Marshall 1988), and observations of more than two adults circling potential nesting areas (Marshall 1988). Surveys by Eisenhawer and Reimchen (1990) indicate that murrelets may prefer to nest in old-growth areas at

low elevations rather than high elevations.

Important nesting areas have not been identified in Washington, and the murrelet's status in the Skagit River Basin is unknown but is currently under investigation by several agencies (USFS 1990). In the north half of the Mount Baker Snoqualmie National Forest (MBSNF) in 1991, biologists conducting surveys found murrelets using forests at 15 of 60 sites investigated, thus bringing the total number of known nests to two and the number of occupied sites to 45 (USFS 1992).

Nests in the northwestern states are located on large, moss-covered branches of mature or old-growth conifers and may occur farther inland than in more southern areas (Paton et al. 1990). To date, the murrelet has been observed in many areas in the basin, including an area approximately 55 miles inland; although nests have not been found in the basin, they are suspected to be present. Over 90 percent of observations in the northern Washington Cascade Mountains have been within 37 miles of the coast (FR 57, No. 191, p. 45328-37, October 1, 1992).

The loss of murrelet nesting habitat in coastal mature and old-growth forests appears partly responsible for the bird's population decline. The species no longer occurs in significant numbers in areas where most old-growth forest has been cut (Marshall 1988). Other factors include a variety of mortality hazards at sea, such as gill-netting and oil spills. Man-caused mortality can have a great impact on murrelet populations because the birds have a low reproductive rate and cannot quickly recoup the losses of large numbers of individuals—a murrelet female does not nest until it reaches two years of age, lays only one egg in the nest, and may not nest every year (Anon. 1991; Marshall 1988).

No murrelet nests are known to be located near the SRP. Few, if any, nests would be expected in the project area because the area is mostly more than 60 miles from marine environments. The murrelet could fly or nest near the power line route associated with the SRP. The altitude of murrelet flights between the sea and nest sites is unknown; however, these flights are probably high enough to avoid collisions with power lines. Also, it is unlikely that any murrelet nest is located near the SRP power line route, because the route lies almost entirely on private land in river valleys, where suitable old-growth forest for nesting is unlikely to be present.

The proposed action as summarized above and as described in more detail in the EA is not likely to adversely affect the marbled murrelet. The small amount of construction activity associated with upgrades of existing facilities in the RLNRA would be unlikely to affect any murrelet nest site. Moreover, the project facilities are farther from marine environments than

any known murrelet nest site. In the riparian corridor, which is approximately 20 miles from marine environments, no old-growth coniferous forest would be affected by habitat management activities to promote elk and deer winter range, and only a small fraction of the corridor would be actively managed. Thus, no old-growth coniferous trees in which murrelets might nest would be expected to be cut, and management activities should not disturb any murrelets that may nest in the area.

Gray Wolf

The gray wolf is listed by the FWS as endangered in the 48 conterminous states except Minnesota (50 CFR 17.11). Its historic range covered most of North America, including all of the Pacific Northwest. After being apparently eliminated as a breeding resident of Washington by 1930, the wolf appears to be making a comeback. About 70 reliable sightings of wolves have been reported in the North Cascades region since 1980, including 11 that were confirmed to definitely have been observations of wolves [Washington Department of Wildlife (WDW), 1992, Wildlife Nongame Data System]. Sightings have been concentrated around Ross Lake. In May 1990, an active wolf den was discovered near the Canadian border in the Ross Lake National Recreation Area (RLNRA) (Anon. 1990b).

Although no recovery plan has been drafted for the gray wolf in this area, several agencies are considering a study to determine the feasibility of wolf reintroduction and recovery in the region (USFS 1990). Wolves are wide-ranging, use a variety of habitat types, and depend primarily on large mammals such as deer and elk for food. Their populations have declined greatly as a result of conflicts with humans (Paradiso and Nowak 1982; Peterson 1986). Encounters with recreationists using SRP lands would be unlikely to adversely affect wolf populations.

The proposed action as summarized above and as described in more detail in the EA is not likely to adversely affect the gray wolf. The small amount of construction activity associated with upgrades of existing facilities in the RLNRA would be unlikely to affect any wolf den site. Also, wolves are so wide ranging and use such a wide variety of habitats that the small amount of habitat damage and construction activity associated with facility upgrades would have negligible, if any, impact. Recreation associated with existing facilities and facility upgrades would not be expected to be intensive enough to affect the wolf. In the riparian corridor, habitat management activities would also not be intensive enough to adversely affect the wolf. Maintaining a small fraction of the corridor in clearcuts under the SA could benefit the wolf by increasing prey populations.

Grizzly Bear

The grizzly bear, a subspecies of the brown bear, is relatively susceptible to cumulative impacts of human disturbance (Weaver, Escano, and Winn 1987) and is listed by the FWS as threatened (50 CFR 17.11). Craighead and Mitchell (1982) show the North Cascades area within Washington to be within the bear's historic range, but Servheen (1985) does not. The bear apparently maintains a very low population level in the North Cascades region, as sightings have been reported only sporadically for many years. The USFS documented 36 grizzly bear observations from the mid-1850s to 1983, mostly in the Glacier Peak Wilderness (USFS 1990). All except one of the observations were in designated wilderness areas or other roadless areas.

Approximately 90 reliable observations in the North Cascades were reported since 1980, including 14 that were confirmed to have been observations of grizzly bears (WDW 1992. Wildlife Nongame Data System). During the last few years in the basin, grizzly bear signs were confirmed in the RLNRA and near Watson Lakes east of Baker Lake.

Several cooperating government agencies have determined that a resident population of bears inhabits the North Cascades ecosystem and have designated this area as a grizzly bear recovery area in accordance with the Grizzly Bear Recovery Plan (FWS 1990). Interagency biologists have determined that the North Cascades ecosystem, including areas outside national forest, has the biological capacity to support several hundred grizzlies (USFS 1992). Recommendations for the recovery area would include minimizing human-bear conflicts and habitat loss. As they search for food, grizzlies use a wide variety of habitat types, ranging from low elevations in the early spring to high elevations in late spring, summer, and fall. The continued presence of the SRP reservoirs, as a feature of the existing environment, may somewhat limit their future numbers in the area by precluding developing of additional suitable habitat. Encounters with recreationists using SRP lands are unlikely to adversely affect grizzly bear populations.

The proposed action as summarized above and as described in more detail in the EA is not likely to adversely affect the grizzly bear. The small amount of construction activity associated with upgrades of existing facilities in the RLNRA and the low elevations at which these activities would occur make it unlikely that any bear den site would be affected. Also, grizzlies range widely, and thus the amount of bear foraging habitat that would be affected, if any, would be a negligible fraction of any bear's home range. Recreation associated with existing facilities and facility upgrades would not be expected to be intensive enough to affect the grizzly. In the riparian corridor, habitat management activities would also not be

intensive enough to adversely affect the grizzly. Maintaining a small fraction of the corridor in clearcuts under the SA could benefit the grizzly by providing more foraging habitat.

CONCLUSION

This BA assessed potential impacts on the peregrine falcon, bald eagle, northern spotted owl, marbled murrelet, gray wolf, and grizzly bear. In each case, the Commission's staff concludes that the proposed action is unlikely to adversely affect the species.

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