Low Impact Hydropower Certification Questionnaire -
Applicant: Seattle City Light
Facility: Skagit River Hydroelectric Project
December 2002

Background Information

1) Name of Facility.

   Skagit Hydroelectric Project

2) Applicant's name, contact information, and relationship to the Facility. If the Applicant is not the Facility owner/operator, also provide the name and contact information for the Facility owner and operator.

   City of Seattle, City Light Department - Facility Owner and Operator
   Contact: Environment and Safety Division
   700 Fifth Avenue, Suite 3300
   Seattle, WA 98104

3) Location of Facility by river and state.

   Skagit River, Washington state

4) Installed capacity.

Gorge Powerhouse	**207.48 MW**
Diablo Powerhouse	**122.46 MW**
Ross Powerhouse	**360 MW**
TOTAL	**689.94 MW**

5) Average annual generation.

   2,414,772 MWh

6) Regulatory status.

   FERC regulated

7) Reservoir volume and surface area measured at the high water mark in an average water year.

	Surface Area	Volume
Gorge Lake	**240 acres**	**8,500 acre-feet**
Diablo Lake	**910 acres**	**89,000 acre-feet**
Ross Lake	**11,700 acres**	**1,435,000 acre-feet**

8) Area occupied by non-reservoir facilities (*e.g.* dam, penstocks, powerhouse).

191 acres

9) Number of acres inundated by the Facility.

*assumes inundated area is approximately equal to reservoir area, includes area of original river surface

	Surface Area
Gorge Lake	**240 acres**
Diablo Lake	**910 acres**
Ross Lake	**11,700 acres**

10) Number of acres contained in a 200-foot zone extending around the entire impoundment.

Gorge Lake	**233 acres**
Diablo Lake	**356 acres**
Ross Lake	**1,464 acres**
TOTAL	**2,053 acres**

11) Please attach a list of contacts in the relevant Resource Agencies and in non-governmental organizations that have been involved in Recommending conditions for your Facility.

A. Flows

Gary Sprague	**Washington State Department of Fish and Wildlife**	**360 902-2539**
Steve Fransen	**National Marine Fisheries Service**	**360-753-9440**
Stan Walsh	**Skagit System Cooperative (Skagit Tribes)**	**360 466-1512**

B. Water Quality

Rod Sakrison	**Washington Dept. of Ecology**	**425-649-4447**
Bob Wright	**Washington Dept. of Ecology**	**425-649-7060**

C. Fish Passage and Protection

Gary Sprague	**Washington State Department of Fish and Wildlife**	**360-902-2539**
Steve Fransen	**National Marine Fisheries Service**	**360-753-9440**
Stan Walsh	**Skagit System Cooperative (Skagit Tribes)**	**360-466-1512**

D. Watershed Protection

Jim Chu	**U.S. Forest Service**	**360-856-5700 ext. 230**
Don Gay	**U.S. Forest Service**	**360-856-5700 ext. 236**
Gene Stagner	**U.S. Fish and Wildlife Service**	**360-753-4126**
Bob Kuntz	**National Park Service**	**360-856-5700 ext. 368**
Lora Leschner	**Washington Department of Fish and Wildlife**	**425-775-1311 ext. 121**
Fayette Krause	**North Cascades Conservation Council**	**206-343-4345 ext. 337**

E. Threatened and Endangered Species Protection

Jim Chu	**U.S. Forest Service**	**360-856-5700 ext. 230**
Don Gay	**U.S. Forest Service**	**360-856-5700 ext. 236**
Steve Fransen	**National Marine Fisheries Service**	**360-753-9440**
Jeff Chan	**U.S. Fish and Wildlife Service**	**360-753-9542**
Gene Stagner	**U.S. Fish and Wildlife Service**	**360-753-4126**
Bob Kuntz	**National Park Service**	**360-856-5700 ext. 368**
Lora Leschner	**Washington Department of Fish and Wildlife**	**425-775-1311 ext. 121**
Fayette Krause	**North Cascades Conservation Council**	**206-343-4345 ext. 337**
Stan Walsh	**Skagit System Cooperative**	**360-466-1512**

F. Cultural Resource Protection

Brian Cladoosby, Tribal Chair	**Swinomish Indian Tribal Community**	**360-466-7205**
Scott Schuyler, Chairperson	**Upper Skagit Tribe**	**360-854-7009**
Jason Joseph, Chair	**Sauk-Suiattle Tribe**	**360-436-0131**
Gretchen Luxenberg	**National Park Service**	**206-220-4138**
Stephanie Toothman	**National Park Service**	**206-220-4139**
Bob Mierendorf	**National Park Service**	**360-873-4590**

G. Recreation

Bill Paleck	**National Park Service**	**360-856-5700 x651**
Jim Chu	**U.S. Forest Service**	**360-856-5700 x230**
Saul Weisberg	**North Cascades Institute**	**360-856-5700 x210**

12) Please attach a description of the Facility, its mode of operation (i.e. peaking, run of river) and a map of the facility.

The Skagit River Hydroelectric Project (Project) is located in the upper Skagit River basin, in northeastern Puget Sound, Washington. Headwaters of the Skagit River originate in Canada, and the Project occupies a scenic area in the Mount Baker-Snoqualmie National Forest and Ross Lake National Recreation Area, adjacent to North Cascades National Park (Figure 1). The Skagit River basin, the third largest in Washington, drains 3,140 square miles, including about 390 square miles in Canada. The Skagit River and its tributaries drain mountain areas from east to west, entering the United States from British Columbia at river mile (RM) 127 and flowing a total of 162 river miles to Puget Sound near Mount Vernon, Washington (Envirosphere 1988). The basin is characterized by rugged mountain topography in the central and eastern parts, and by level floodplains and rolling uplands in the western part.

The three Project dams, Ross, Diablo, and Gorge, are located at RMs 105, 101, and 97, respectively. Combined they have a total power generating capacity of about 690 MW, as reported to FERC. Project hydropower development by Seattle City Light (SCL) spanned three decades, with the completion of Gorge Dam in 1924, Diablo Dam in 1936, and Ross Dam in 1952.

In 1991, SCL entered into historic Settlement Agreements with twelve stakeholders as part of Project relicensing. The stakeholders included federal and state agencies, Native American Tribes, and an environmental group. These agreements were submitted as a package to the Federal Energy Regulatory Commission (FERC) and were intended to fully mitigate the Project's environmental impacts, a key element in license renewal (FERC 1991). For large hydro projects such as the Skagit, the environmental mitigation package historically has been determined by the FERC. SCL's goal was to reach agreement, through a collaborative process with the stakeholders, on environmental mitigation and a new license. Settlement Agreements on fisheries, wildlife, recreation and aesthetics, erosion control, cultural resources (archaeological and historic resources), and traditional cultural properties were signed by all parties.

The Agreements were recognized as a national model and have been called "the most comprehensive set of Settlement Agreements for the public good ever submitted to FERC." (Dean Shumway, Director, FERC Office of Hydropower Licensing, December 18, 1992). On May 16, 1995, the FERC issued a new operating license that largely incorporates the Settlement Agreements as license requirements. An order on rehearing, issued on June 26, 1996, incorporates the remainder of the Settlement Agreements into the license.

The three dams are hydraulically coordinated to supply approximately one-fourth of SCL's power requirements, while maintaining instream flows beneficial to salmon reproduction and rearing. In addition, the Project provides flood control storage and a variety of high-quality recreational opportunities, including hiking, sport fishing, boating, and guided tours. The fish resources and the area's scenic qualities were integral in the lives of Native American tribes who occupied the basin. Many historic cultural sites can be found throughout the basin.

Ross Dam, the Project's uppermost facility, impounds the high-quality waters of Ross Lake, a 24-mile-long reservoir extending about 1½ miles north of the U.S.-Canada border. Ross Lake, which is surrounded by the Ross Lake National Recreation Area, is the primary storage reservoir for the Project; it is used for flood control as well as power generation.

Water level fluctuations in Ross Lake vary annually and may range from 1,602.5 feet above mean sea level (MSL) to 1,475 ft MSL. SCL maintains the reservoir near full-pool elevations from July through October for recreational and aesthetic purposes. Reservoir elevations remain high through the migratory and spawning periods of native char (bull trout and Dolly Varden) and rainbow trout, allowing these species access from the lake to high-quality spawning grounds in the tributaries. Lands bordering Ross Lake are moderately to steeply sloped and forested; glaciers draining to the basin contribute cool waters that provide excellent summer habitat for native bull trout and rainbow trout. Major tributaries to Ross Lake include Big Beaver, Little Beaver, Ruby, Lightning, and Devil's creeks (Envirosphere 1988).

Diablo Dam, located downstream from Ross Dam creates Diablo Lake which is 4½ miles long and used primarily for daily and weekly regulation of discharge from Ross. Full pool elevation is 1,205 ft MSL and annual water level fluctuations range from 10 to 12 ft. Much of the land surrounding Diablo Dam consists of steep, exposed rock or talus sparsely covered with scattered conifers and shrubs. The remaining areas are moderately to steeply sloped and forested. Thunder Creek is the major tributary to Diablo Lake (Envirosphere 1988).

The most downstream generating facility, the Gorge Dam and Powerhouse, is located about 4 miles downstream of Diablo Dam. Gorge Lake is smallest of the three Skagit reservoirs and fluctuates only a few feet from its full pool elevation of 875 ft MSL. Both the Diablo and Gorge facilities are operated with water released from Ross Powerhouse. There is very limited storage in the Gorge and Diablo reservoirs. Gorge Lake is aptly named for the cliffs and talus slopes comprising much of the area bordering the reservoir. The few flat areas adjacent to the reservoir are developed, and the remaining steep areas have been logged (Envirosphere 1988).

The Gorge reach of the Project marks the historical limit of anadromous salmon migrations in the upper river. Below the Gorge Powerhouse, the river is free of impoundments and is protected under the National Wild and Scenic Rivers Act. River reaches immediately downstream of the Powerhouse are most affected by Project operations. Project influences on river flows decrease progressively downstream, and are moderated by flow contributions from major tributaries that include the Cascade (RM 77), Sauk (RM 66), and Baker (RM 56) rivers.

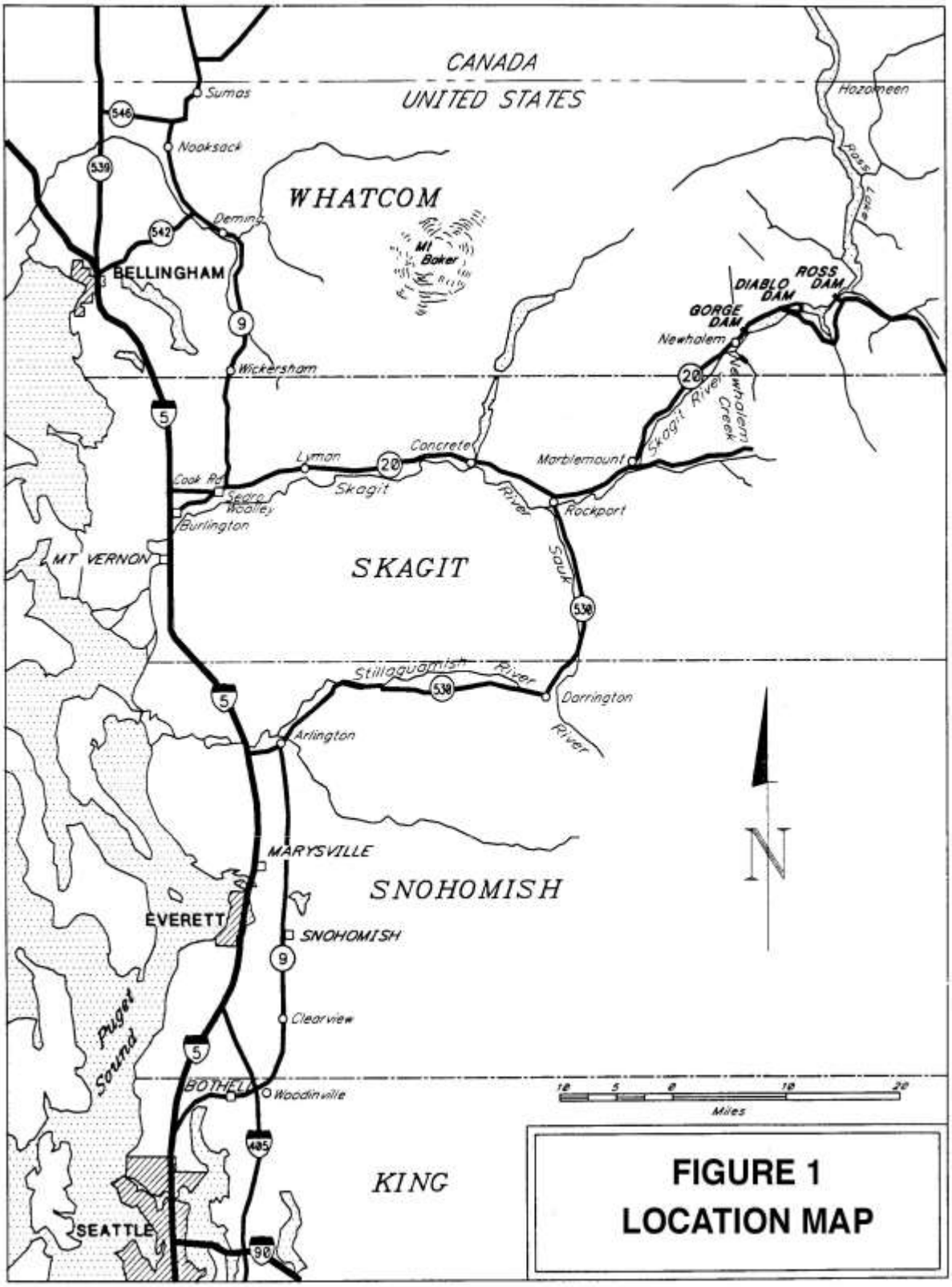
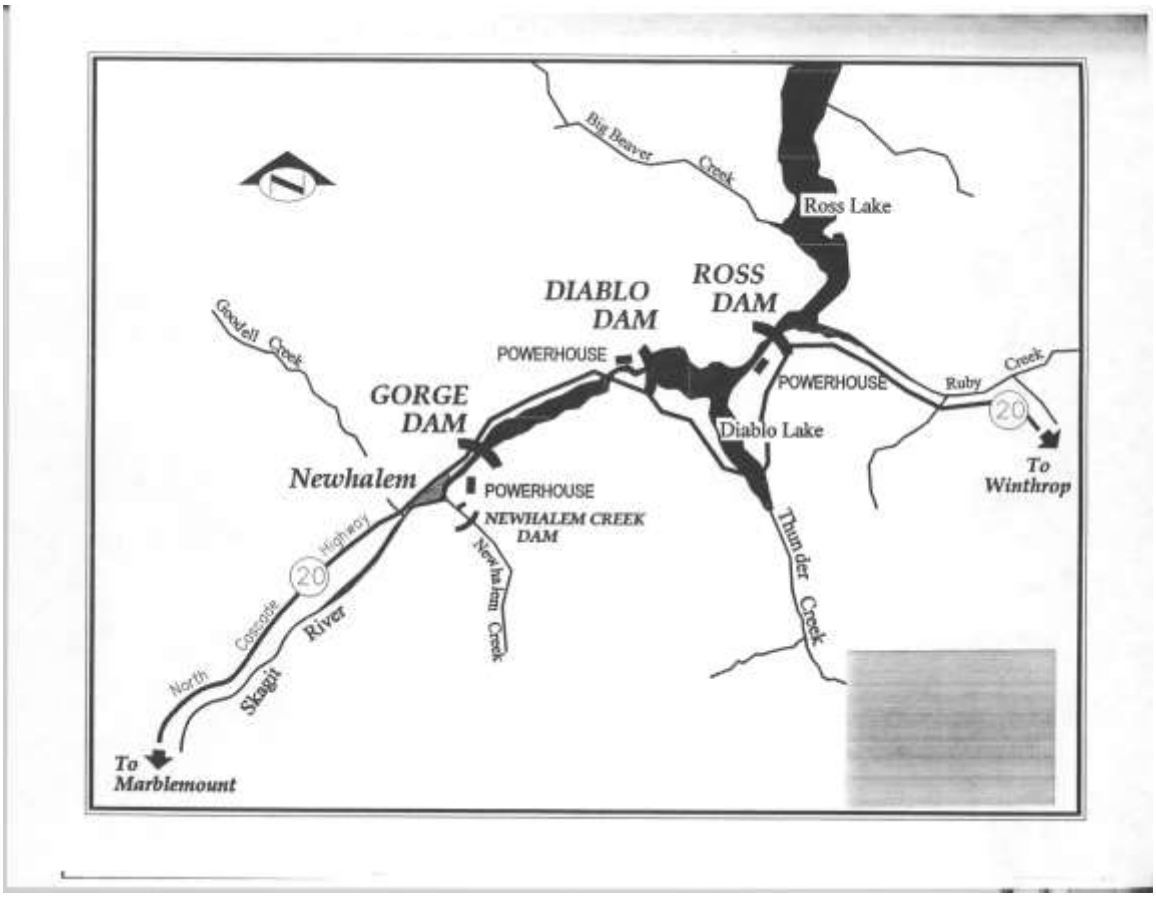


FIGURE 1
LOCATION MAP



Please see attached photos of the Project townsites, dams and powerhouses.

A. Flows

1) Is the facility in compliance with resource agency recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic flow variations) for both the reach below the tailrace and all bypassed reaches?

Answer: **Yes = Pass, Go to B**

Background

Seattle City Light's (SCL's) three Facilities on the Skagit River, (Gorge Dam and Powerhouse, Diablo Dam and Powerhouse, and the Ross Dam and Powerhouse) are operated as a single project, and are referred to as a single project in the FERC license - "Skagit River Hydroelectric Project, FERC No 553". The Low Impact Hydropower process defines a Facility as the combination of a dam and powerhouse, and this is how SCL's application fee is calculated, for practical and license purposes, the Facilities are operated as a unit. Resource Agency Recommendations for flows were made for the Skagit Project as a whole, rather than separate requirements for each of the three Facilities, to provide maximum benefit for fish.

The Skagit Fisheries Settlement Agreement resulted in a number of major changes to Project operations and were intended to reduce or eliminate the negative impacts of flows on salmon and steelhead in the upper Skagit River. Based upon the results of hydrological, instream flow, redd protection, and fry stranding models, SCL implemented flow management measures met or exceeded the conditions specified by the Settlement Agreements. These measures were implemented in two phases. First, interim flow measures were established between 1981 and 1990 prior to FERC's Project relicensing. These flow measures were intended to protect the eggs and embryos of steelhead, chinook salmon, pink salmon, and chum salmon from dewatering during their incubation period, and to minimize the stranding of salmon and steelhead fry on gravel bars in the river. More stringent measures were established as part of the final Fisheries Settlement Agreement, which was implemented voluntarily in January 1990. Voluntary implementation continued until 1995 when the FERC license was issued for the Project.

The Settlement Agreement applies to all Facilities of the Skagit Hydroelectric Project, including Ross, Diablo, and Gorge dams. The Agreement applies to all waters within the project area, including reservoirs, receiving waters, and tailwaters. Minimum instream flows requirements are not applicable to the reach between Gorge Dam and Diablo Dam (Gorge Lake), and between Diablo Dam and Ross Dam (Diablo Lake), because these two reaches are fully inundated by reservoir waters. In addition, "The limitations on storage capacity in Gorge and Diablo Lakes mean that Ross Dam is the only effective point of control of downstream flows." (Skagit Fisheries Settlement Agreement, Section 6). The Settlement Agreement focused mainly on flows in the 25-mile reach downstream of the Skagit River below Gorge Powerhouse, because this reach supports that largest number of spawning chinook salmon, chum salmon, and pink salmon in the Skagit River basin. The importance of this reach becomes even more significant when considering that the Skagit River possesses the largest run of native chinook salmon in the Puget

Sound Region, and the largest run of chum salmon and pink salmon in the coterminous United States.

The Fisheries Settlement Agreement "resolves all issues related to the effects on fisheries resources of the Project, as currently constructed, for the period May 12, 1981 through the duration of this Agreement." In addition "The Parties stipulate that this Agreement constitutes adequate fish protection and compensation for fishery losses caused by the Project, as currently constructed, for the period May 12, 1981 through the duration of this Agreement." (Skagit Fisheries Settlement Agreement, page 2). Agencies and Tribes were signatories to this Settlement Agreement.

Flow Requirements

The Project monthly flow requirements are determined by a series of calculations designed to provide protection for salmon and steelhead, and change from year to year, depending on precipitation and river levels. These flow requirements are conditioned by reservoir elevation, seasonal runoff and episodic variations in runoff (including tributary outflows below the project) to provide the operational flexibility needed to provide the highest possible level of protection to all life stages of salmon and steelhead in the upper Skagit River. These calculations are fairly detailed, and are described in the Appendices of the Skagit Fisheries Settlement Agreement.

The Project is in full compliance with resource agency recommendations for flows for fish and wildlife protection, mitigation, and enhancement. Flow releases in the Skagit River downstream of Gorge Powerhouse follow the requirements of the 1991 Settlement Agreement, which was developed in consultation and partnership with the agencies and Tribes.

Effect of Flow Requirements and Monitoring Results

The flow regime in the Skagit River under the Settlement Agreement provides eggs and embryos with high levels of protection from dewatering by imposing greater constraints on maximum flows during the salmon spawning period, and by sustaining higher minimum flows during the incubation period. If flows are relatively high during the spawning period, then higher flows will be released from the project storage (provided by Ross Lake) during the fish incubation period. The flow provided by the Project during low-flow periods is determined by modeling to provide dewatering protection to eggs and embryos. The effective protection levels range from 90 to 100 percent, depending on tributary inflow conditions.

Minimum flow levels in the Skagit River have significantly increased as a result the Settlement Agreement (Connor and Pflug *In Press*). During the biologically critical salmon incubation period, minimum flows have increased in almost all years when compared to flows that occurred prior to the implementation of the agreements (i.e., before 1981). Minimum flows during the chinook salmon incubation period have increased from 1,300 cfs under pre-agreement conditions to 2,100 cfs under the final negotiated settlement (Figure 1). For pink salmon, minimum incubation flows during have increased from 1,400 cfs under pre-agreement conditions to 2,100 cfs under the final negotiated settlement. Flow improvements are greatest for the incubation period of chum salmon, with minimum incubation flows increasing from 1,600 under pre-agreement conditions to 2,600 cfs under the final negotiated settlement.

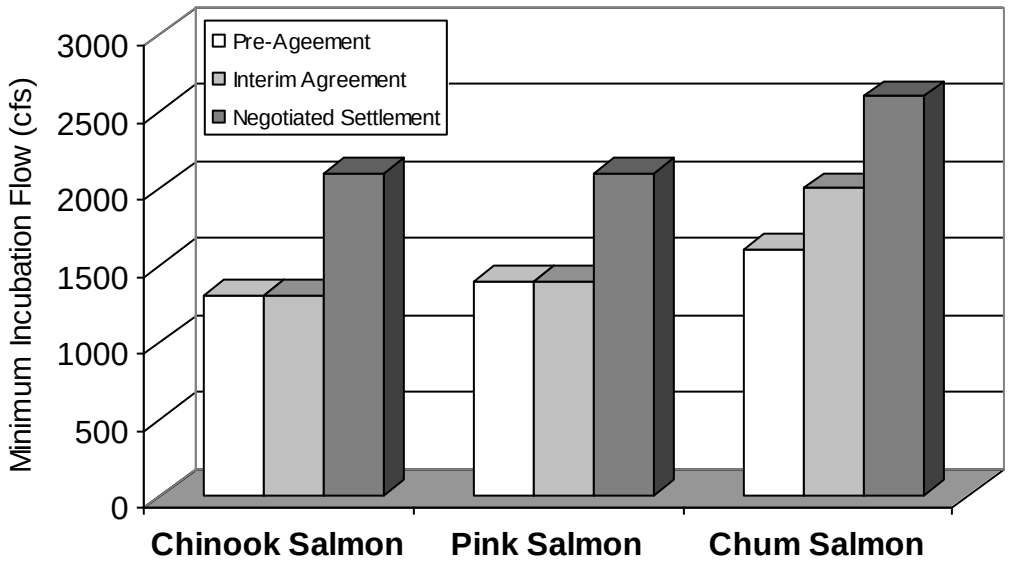


Figure 1. Minimum flows in the Skagit River during the chinook, pink, and chum salmon spawning periods under pre-agreement, interim agreement, and negotiated settlement flow regimes.

Project operations have been substantially modified to minimize the stranding of salmon and steelhead fry along the gravel bars that are abundant throughout the 25-mile reach of the Skagit River below the project. Prior to the implementation of flow measures under the Settlement Agreement, large numbers of stranded salmon fry were frequently observed along the margins of the river following project downramping events. Seattle City Light commissioned the University of Washington (Fisheries Research Institute) to conduct a number state-of-the-art studies to examine the relationships between daily flow fluctuations and fry stranding, and identify specific flow measures that would minimize stranding and resulting mortality to fish. These studies, which were initiated in the mid 1970s, found that salmon fry standing was minimal when project downramping rates were less than 3,000 cfs per hour, and when downramping occurred during the night. Salmon and steelhead fry were found to be highly susceptible to stranding during daylight downramping events, a result of the movement of fry into gravel beds during the day to avoid predators. Based upon the results of these scientific studies, maximum downramping rates of 3,000 cfs per hour were established under the Settlement Agreement (note: SCL now maintains downramping rates below 1,500 cfs per hour most of the time to minimize stranding juvenile fish), and is limited to periods of darkness (Figure 2). Most downramping events now occur during period of darkness (Figure 3). This has greatly reduced fry stranding in the Skagit River below the project.

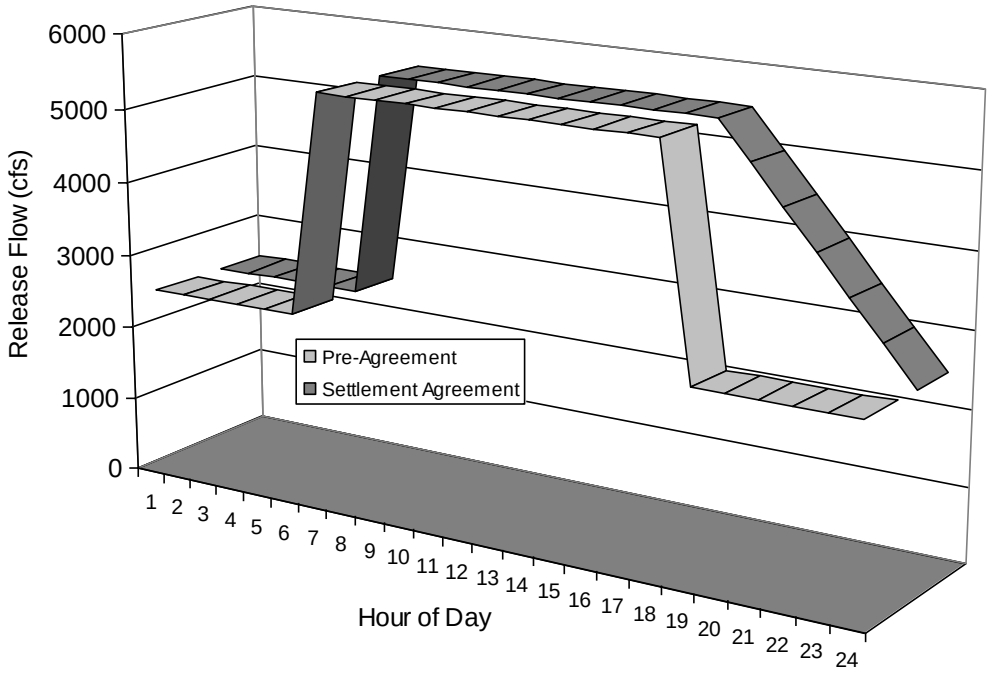


Figure 2. Example of daily flow release pattern from Skagit Project before and after implementation of Settlement Agreement.

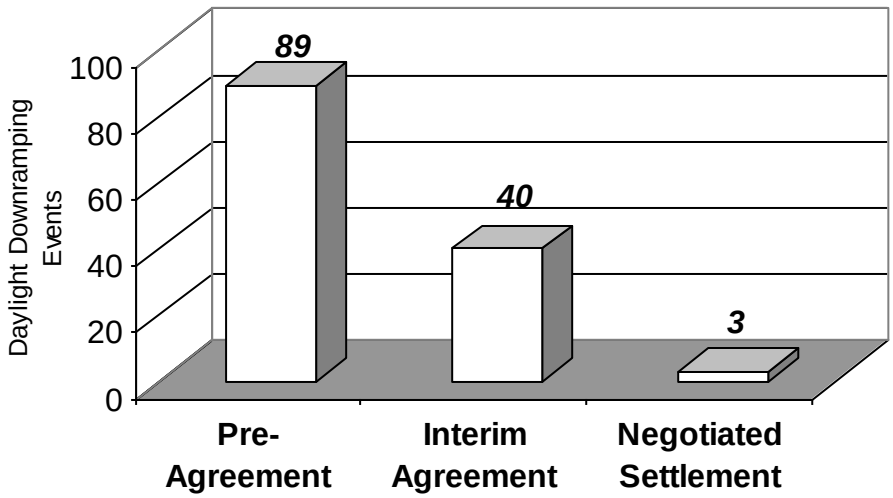


Figure 3. Average number of daylight project downramping events per year under pre-agreement, interim agreement, and Negotiated Settlement flow regimes.

Flows under the Settlement Agreement also protect salmon and steelhead redds from high flow events that historically resulted in the physical scouring of redds and high levels of egg mortality in the Skagit River. Flows in the river still experience natural variation due to substantial tributary inflows, which help maintain the river channel in a state that provides high-quality spawning and rearing habitat to anadromous and resident fish. Spawning gravel is abundant in the river below the project, and large amounts of gravel move into the river each year from glacial fed tributaries. The higher baseflows provided under the Settlement Agreement help sustain cold water temperatures the Skagit River throughout the year, providing excellent habitat conditions for anadromous and resident fish. Water quality conditions in the Skagit River are considered excellent due to the cold and clean water originating from the upper Skagit River drainage, which is largely located within mountainous national park and wilderness areas in the United States and Canada. The presence of a healthy population of native bull trout is largely a result of the high water quality conditions in the Skagit River and tributaries.

Flows in the Skagit River under the Settlement Agreement provide high-quality habitat conditions for all life stages of fish. Moreover, salmon and steelhead are protected from low-flow conditions that would previously have resulted in mortality to eggs and embryos. In addition, SCL has specified in the Settlement Agreement its intention to operate the project in a manner that provides "full and complete" protection of anadromous fish spawning, incubation, and rearing. To achieve this goal, SCL routinely goes beyond the required flow protection requirements of the Settlement Agreement. Although these are voluntary actions, SCL realizes the importance of the "best efforts clause" in achieving full protection. The "best efforts clause" is intended to deal with unexpected flow conditions (typically flood or drought related circumstances) that fall outside of SCL's control and responsibility. When a "best efforts" need arises, SCL, the fisheries resource agencies and tribes cooperatively determine the best course of action. These efforts have resulted in instream flow protection for salmon that surpasses the requirements of the Agreement. In each year since 1991, SCL has voluntarily provided additional minimum flows, lasting from weeks to months, to protect incubating salmon.

The Skagit River basin currently supports the most abundant run of naturally spawning chinook salmon in Puget Sound; with annual returns of summer/fall chinook salmon averaging about 8,000 fish in the mainstem Skagit River below the project (WDF et al. 1993; Myers et al. 1998; NMFS 1999a, NMFS Technical Review Team 2002). This stock has been rated as "healthy" by the WDFW (WDF et al. 1993). Although trends in chinook salmon abundance throughout the Puget Sound region have been declining, the number of spawning chinook in the 25-mile reach of the Skagit River below the project has remained stable based on long-term spawning survey databases maintained by the WDFW since 1974 (Olsen and Knutzen 1997). Surveys were conducted in the mainstem Skagit River in reaches most affected by project operations (Figure 4). Because chinook abundance has declined overall in Puget Sound, the National Marine Fisheries Service (NMFS) has listed Puget Sound chinook as threatened under the Endangered Species Act.

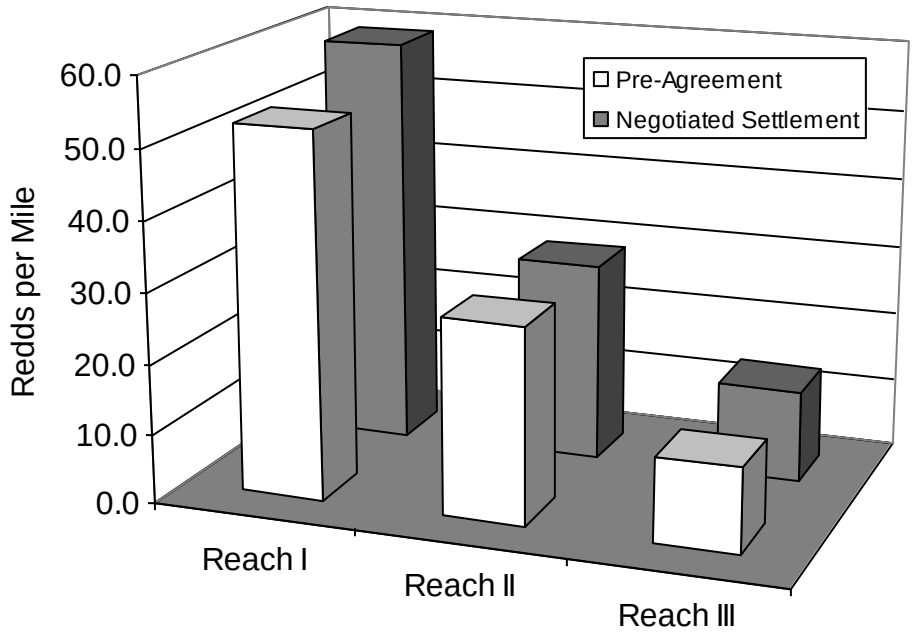


Figure 4. Average number of chinook salmon redds per mile prior to and following implementation of flows under Settlement Agreement. Reach I is located downstream of project, Reach II is located downstream of Cascade River, and Reach III is located downstream of Sauk River.

Three stocks of chum salmon use the Skagit River basin; all are fall run fish. Chum salmon in the upper Skagit River prefer to spawn in mainstem reaches, side channels, and sloughs (Connor and Pflug, *In Press).* The abundance of chum salmon spawners in the Skagit River is cyclical, with greater numbers (more than 140,000) present during even-numbered years when pink salmon are relatively scarce (WDF et al. 1993). Skagit River mainstem spawning chum salmon were recently ranked as a "Level I Healthy" population by the American Fisheries Society (Huntington et al. 1996). Level I indicates populations considered to be at least two-thirds as abundant as would be expected in the absence of human impacts. This stock is considered "healthy" by the WDFW (WDF et al. 1993). Recently, NMFS also completed a comprehensive assessment of the status of chum salmon populations in Washington, Oregon, and California (Johnson et al. 1997). Because current abundance of chum salmon within the Puget Sound ESU is at or near historic levels, Puget Sound chum are not warranted for listing under the ESA (NMFS 1998). Numbers of chum salmon spawning in reaches below the Project have increased significantly since flow management measures were implemented. Within the two river reaches located just below the Project there has been a 4- to 8-fold increase in spawners per mile since instituting protective flows (Figure 5).

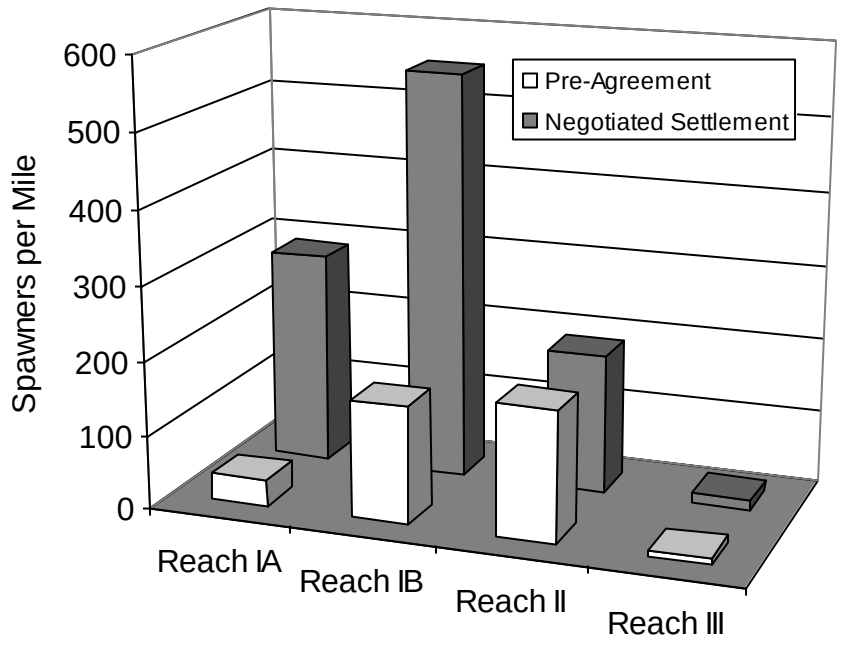


Figure 5. Average number of chum salmon carcasses per mile prior to and following implementation of flows under Settlement Agreement. Reach IA and IB are located downstream of project, Reach II is located downstream of Cascade River, and Reach III is located downstream of Sauk River.

Pink salmon spawn throughout the Skagit River drainage in large numbers, exhibiting a cyclic dominance in which spawning abundances are greater during odd-numbered years. Run sizes range from approximately 200,000 to 1,400,000 spawners, and over ninety percent of pink salmon spawn in mainstem sections of the river. Skagit River pink salmon are classified as "healthy" by the WDFW, and continue to support high harvest levels while maintaining escapement levels in the hundreds of thousands (WDF et al. 1993). Skagit River pink salmon were recently given the only "Level I Healthy" ranking of pink salmon in the Pacific Northwest by the American Fisheries Society (Huntington et al. 1996). Pink salmon spawners abundance (measured by carcass counts) in the mainstem Skagit River below the project has increased to more than 1,500 per mile, representing a 5-fold increase since 1985 (Figure 6) (Hard et al. 1996). Due to their recent comprehensive assessment of pink salmon populations in Washington, Oregon, and California, NMFS determined that the odd-year and even-year pink salmon ESUs, which includes the Skagit basin, do not warrant listing as a threatened or endangered species (Hard et al. 1996; NMFS 1995).

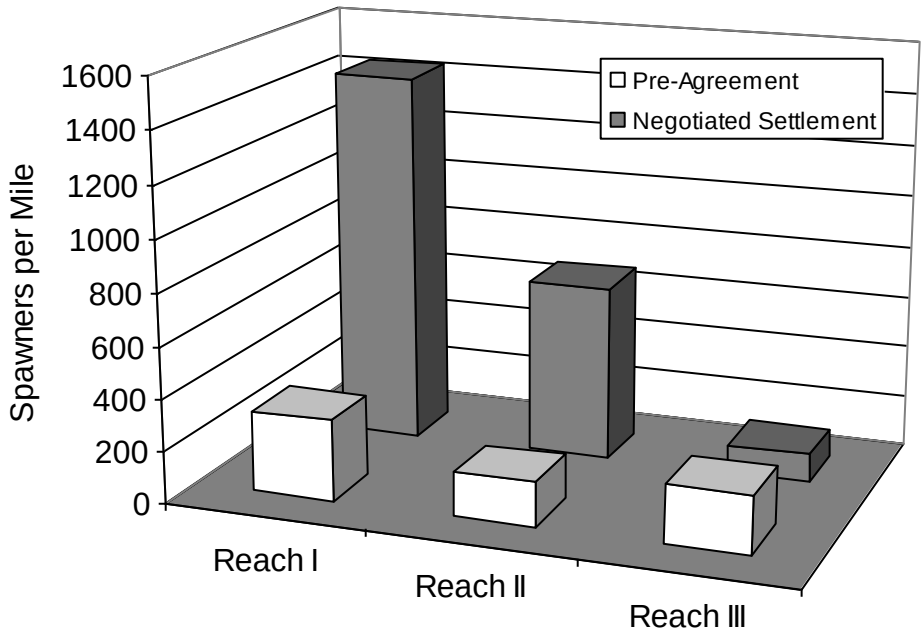


Figure 6. Average number of pink salmon carcasses per mile prior to and following implementation of flows under Settlement Agreement. Reach I is located downstream of project, Reach II is located downstream of Cascade River, and Reach III is located downstream of Sauk River.

B. Water Quality

1) Is the facility either:
a. In compliance with all conditions issued Pursuant To Clean Water Act section 401 water quality certification issued for the Facility after December 31, 1986? Or
b. In compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?

Answer: Yes = Go to B2

The upper Skagit River is in compliance with the quantitative water quality standards established by the state of Washington (Washington Administrative Code (WAC) 173-201A-030) and supports the designated beneficial uses.

WAC standards for the Skagit River reach below the Project, Class AA freshwater:

- Fecal Coliform - "fecal coliform organism levels shall both not exceed a geometric mean value of 50 colonies/100 mL and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 100 colonies/100 mL"
- Dissolved Oxygen - "dissolved oxygen shall exceed 9.5 mg/L"
- Temperature - "shall not exceed 16.0°C due to human activities. When natural conditions exceed 16.0°C , no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3°C. Incremental temperature increases resulting from point source activities shall not, at any time, exceed t=23/(T+5). Incremental temperature increases resulting from nonpoint source activities shall not exceed 2.8°C. For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge."
- pH - "shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.2 units"
- Turbidity - "shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU"

Long-term monitoring records do not indicate any violations of water quality standards. Monthly samples are collected at the nearest USGS water quality data collection site at Marblemount (RM 78.1; approximately 16 RM below the Project), and data at this sampling site exist for the years 1959 through 2002 for: fecal coliform, dissolved oxygen, pH, temperature, turbidity, and other water quality parameters for which there are no numeric standards. (Washington Department of Ecology web site)

The Project has minimal impact on the water quality of the upper Skagit River. This river drains mountainous and glacial areas located mainly within national park and wilderness areas, and water flowing through the Project remains clean and cold throughout the year. This section of the Skagit River is not listed on the State's list of impaired water bodies. The Washington State Department of Ecology has stated in a letter to Seattle City Light that they support the water quality conditions for the Project. They also have acknowledged by letter that they waived their action on Section 401 due to situations beyond their control. (Washington Department of Ecology, letters October 7, 1991, and December 13, 1991) Furthermore, the Skagit River basin supports some of the healthiest fish populations in Washington, which reflects the excellent water quality conditions in the Project area.

Turbidity and suspended sediments. Turbidity upstream of the project area is influenced by seasonal runoff of silt and glacial flour. The USGS monitoring station at Marblemount does show some exceedances of total suspended solids and turbidity in the last ten years, but this is considered related to the glacial till. The Project does not appear to exacerbate turbidity and suspended sediments, nor is this section of the Skagit 303(d) listed for turbidity (Washington Depatment of Ecology web site).

Temperature. Water temperatures downstream of the Project in the Skagit River remain cold throughout the year. Based on water year 2001 assessment, the overall water quality at this station met or exceeded expectations and is considered of lowest concern (Washington Depatment of Ecology web site).

The Skagit River from Gorge Dam (RM 96.6) downstream to Gorge powerhouse (i.e., bypass reach) has a special condition status under State water quality standards (WAC 173-201A), which mandates that water temperatures are not to exceed 21º C as a result of anthropogenic activities. Temperature monitoring conducted by SCL indicates that temperatures in the 2.7-mile bypass reach do not exceed this value (Envirosphere 1988).

Temperatures in the Skagit River are warmest in July, August, and September. Average daily temperatures of the Skagit River typically range between 8 °C and 11 °C in July, while average daily temperatures in August and September typically range from 10 °C to 11 °C. Maximum daily temperatures of the Skagit River at Marblemount usually do not exceed 14 °C during the warmest periods of the year; this is well below the maximum allowable temperature for Class AA waters in the state of Washington. In addition, Ecology deployed two thermographs that measure temperature continuously, starting in July 2001: Newhalem gauging station (gage number 12178000), and at the Marblemount gauging station (gage number 12181000). Neither of these shows any exceedances beyond 13.5 C.

Total dissolved gas. Supersaturation with atmospheric gas, primarily nitrogen, can occur when water spills over high dams, but this does not appear to be a problem for this Project. Total dissolved gas (TDG) monitoring conducted on July 10, 1997, revealed nitrogen saturation did not exceed the water quality standard of 110 percent saturation. Five spill conditions were tested in 1997 and readings for TDG were taken in the Ross Dam forebay and downstream of Gorge Dam powerhouse. The highest measurement, 110.4 percent of saturation, was taken downstream of

the Gorge Dam powerhouse. However, a lower reading of 107.4 percent of saturation was taken on the opposite bank from water flowing through the bypass reach. The three Projects (Ross, Gorge, and Diablo) were not determined to have a cumulative effect on nitrogen saturation (Parametrix 1997).

2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?

Answer: No = Pass

The water quality in this section of the Skagit River is not listed as impaired on the 303(d) list of water quality impaired waters by the state of Washington. The Skagit River areas, including the Project reservoirs and downstream reaches, are not listed on the 303(d) list for 1998 (Washington State Department of Ecology web site).

C. Fish Passage and Protection

1) Is the Facility in compliance with *Mandatory Fish Passage Prescriptions* for upstream and downstream passage of anadromous and catadromous fish issued by the Resource Agencies after December 31, 1986?

Answer: **Not Applicable = Go to C2**

Mandatory fish passage prescriptions were not issued by the agencies for this project. Section 18 of the Federal Power Act requires the construction, maintenance, and operation of fishways prescribed by NMFS (Secretary of Commerce) or USFWS (Department of Interior). Neither agency prescribed a fishway, or requested a reservation of fishway prescription authority, in the Settlement Agreement or in the FERC License. Under the Settlement Agreement, both NMFS and USFWS, along with other signing parties, agreed that "all issues concerning the environmental impacts from relicensing of the project, as currently constructed, are satisfactorily resolved by these Agreements" (Fisheries Settlement Agreement).

The NMFS and USFWS did not prescribe fish passage for anadromous and riverine fish for the Skagit Hydroelectric Project because natural barriers blocked the upstream passage of anadromous and riverine fish through the project area on a historical basis. These natural barriers include numerous falls, bedrock cascades, and velocity barriers in the 2.7-mile reach located between Gorge Powerhouse and Gorge Dam, and a narrow bedrock constriction and falls located near Diablo Dam.

Based upon historical accounts and interviews with homesteaders and early area residents, the only anadromous fish species that was able to migrate through the rugged Gorge reach was steelhead trout. Small numbers of steelhead were observed as far upstream as Stetattle Creek and Reflector Bar, which is located in the Skagit River immediately upstream of the confluence of Stetattle Creek (Envirosphere 1988). During fisheries mitigation negotiations during the late 1920s, the Washington Dept. of Fisheries suggested that small numbers of spring chinook salmon might have moved upstream through the Gorge based upon their swimming abilities. However, there are no accounts of spring chinook salmon actually ascending the Gorge reach. Early residents stated that salmon did not migrate any farther upstream in the Skagit River than Newhalem (Envirosphere 1988). Spring chinook salmon are stronger swimmers than other salmon, but do not have the same ability as steelhead to leap barriers such as falls and to negotiate fast currents (Bell 1991).

The high velocities and extreme turbulence prevalent throughout the Gorge Reach under natural flow conditions would result in poor survival of the eggs and fry of steelhead ascending this far upstream. Historical records indicate that none of the salmon species, which have considerably less ability to leap barriers than steelhead, were able to migrate upstream through this reach.

See the Flows and Threatened and Endangered Species sections for information on the health and productivity of fish populations below the Project.

2) Are there historical records of anadromous and/or catadromous fish movements through the Facility area, but anadromous and catadromous fish do not presently move through the area (e.g., because passage is blocked at a downstream dam or the fish run is extinct).

Answer: **No = Go to C3**

The Gorge Reach of the Skagit River, which is located immediately above Gorge Powerhouse, is a steep and narrow canyon that is a natural barrier to the upstream passage of all salmon species present in the river. Historic records indicate that a few steelhead trout may have occasionally migrated upstream through the narrow gorge under certain flow conditions to Stettatle Creek, which is located about 2 miles above Gorge Dam. Due to the extremely high velocities and turbulent conditions, successful spawning, incubation, and juvenile rearing of steelhead is highly unlikely in this reach.

3) If, since December 31, 1986;

   a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation described in C2a above), and

   b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,

   c) Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are not longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?

Answer: **No = Go to C5**

The resource agencies declined to issue a Mandatory Fish Passage Prescription. The agencies declined this prescription because the Gorge Reach and Diablo Reach (currently inundated) of the Skagit River are considered to be natural barriers to the upstream passage of anadromous fish.

5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of riverine fish?

Answer: **Not Applicable = Go to C6**

The agencies did not issue a Mandatory Fish Passage Prescription for upstream and/or downstream passage of riverine fish.

6) Is the Facility in Compliance with Resource Agency Recommendations for riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?

Answer: **Not Applicable = Pass, go to D**

The agencies did not issue recommendations for entrainment protection.

D. Watershed Protection

1) Is the Facility in Compliance with Resource Agency Recommendations, or, if none, with license conditions, regarding protection, mitigation or enhancements of lands inundated by the Facility or otherwise occupied by the Facility, and regarding other watershed protection, mitigation and enhancement activities?

Answer: **Yes = Pass**

SCL is in compliance with the requirements of the Settlement Agreement Concerning Wildlife. SCL's FERC license requirements for mitigation of Project impacts on terrestrial wildlife in the Project area are outlined in the Settlement Agreement Concerning Wildlife, April 1991. SCL has made significant progress implementing the projects outlined in the Wildlife Habitat Protection and Management Plan (incorporated by reference in the Settlement Agreement Concerning Wildlife).

The principal element of the Wildlife Settlement Agreement is acquisition and management of wildlife habitat lands. Ninety-three percent of $17 million dollars (1990$) committed to land acquisition and management has been spent (SCL FERC Expenditure Statement), and 8,269 acres have been acquired, over half of which is in the Skagit and Sauk River basins. The rest is in the South Fork Nooksack River basin.

A description of wildlife lands purchased is below. Lands have been selected that possess riparian areas and corridors, wetlands, and mature forest communities. These wildlife lands contain important habitat for both terrestrial and aquatic species, such as elk, deer, eagles, salmon and trout, waterfowl, and numerous other species of birds, small mammals, reptiles, amphibians, and plants. Land was strategically selected to complement and link other parcels reserved for wildlife, such as areas owned by the Washington State Departments of Fish and Wildlife and Natural Resources and The Nature Conservancy. SCL works closely with conservation organizations, agencies, and tribes to determine the wildlife value of the purchases.

Habitat enhancement, such as forest stand manipulation, may occur on some properties. The Settlement Agreement includes other programs as well. SCL will provide continuing support to interagency wildlife, ecosystem research, and monitoring efforts in the North Cascades, emphasizing research that will enhance the knowledge and practice of wildlife protection and management in the Project area and Ross Lake National Recreation Area. SCL will provide $50,000 (1990$) each year to fund wildlife and environmental research and studies. A five-member Wildlife Research Advisory Committee meets annually to solicit and review proposals and select Projects for funding. To date, nine projects have been funded, covering a diversity of topics, including grizzly bears, lynx, macroinvertebrate drift, etc.

SCL is providing $20,000 (1990$) each year to support the long-term monitoring of wildlife and environmental resources in the North Cascades National Park Service Complex. It is also providing an annual payment of $20,000 (1990$) to the North Cascades Environmental Education Center to further develop public knowledge and understanding of the values and issues

in wildlife and ecosystem management and protection in the Project area and the North Cascades Area. Annual payments have been made since 1995. SCL completely refurbished an historic building for use by the National Park Service as a wildlife research lab, which was completed in 1999. Finally, SCL has spent $50,000 of $90,000 ($1990) designated to fund the inventory and monitoring of bald eagle activity near the Project by the U.S. Forest Service. The Nature Conservancy of Washington honored SCL with its public service award in 1998 for this work.

Skagit Wildlife Land - Purchases to Date

Location: South Fork Nooksack River basin
Size: 690 acres
Seller: Crown Pacific, Ltd.
Description: Extends approximately 8 miles along the river corridor, varying in width but averaging about 3/4 miles wide. Mainly forested, with mixed conifer and broadleaf trees. Includes a large stand of mature conifers, flat benches which flood periodically, a few sloughs and wetlands, and fairly steep upland slopes. Important area for elk and deer winter range.

Location: South Fork Nooksack River basin
Size: 3,301 acres
Seller: Crown Pacific, Ltd.
Description: Same description as property above.

Location: Mainstem Skagit River
Size: 688 acres
Seller: Crown Pacific, Ltd.
Description: This parcel forms a large contiguous block of land adjacent to land protected by WA Department of Fish and Wildlife. Includes emergent and shrub wetlands, and lowland (primarily) broadleaf forest. Used heavily by bald eagles. Through a cooperative effort, the WA Department of Fish and Wildlife constructed a groundwater channel on the property that provides spawning and rearing habitat for coho and chum salmon, with other benefits to native cutthroat and Dolly Varden trout.

Location: Illabot Creek (tributary to Skagit River)
Size: 373 acres
Seller: Crown Pacific, Ltd.
Description: Illabot Creek, key spawning and rearing habitat for salmon, bisects this property. Hosts a communal bald eagle night roost, supporting upwards of 100 birds. Includes approximately 25 acres of mature and old growth forest that provides optimal winter thermal cover for deer and elk.

Location: Illabot Creek
Size: 320 acres
Seller: Crown Pacific, Ltd. (transaction made through The Nature Conservancy)
Description: Same as property above.

Location: Barnaby and Lucas Sloughs
Size: 485 acres
Seller: Crown Pacific, Ltd.
Description: Rich, lowland, wetland, slough complexes, adjacent to Department of Fish and Wildlife's property. Provides off-channel habitat for native salmon, which is very limiting in the nearby system.

Location: Sauk River (major tributary to the Skagit River)
Size: 162 acres
Seller: Private, small landowner
Description: Straddles the Sauk River, taking in a portion of the Dan Creek slough complex. Very rich, diverse lowland habitat. Area hosts a significant number of wintering bald eagles who feed on the property and use it for perching during the day (there is a possibility that they roost here at night, but this has not been confirmed). Supports the heaviest known chum spawning concentration of the Sauk fall chum run.

Location: Bacon Creek (tributary to the Skagit River)
Size: 120 acres
Seller: Private, small landowner
Description: The lower portion of the property straddles Bacon Creek. Diverse habitat types: floodplain, riparian, side channels, aquatic habitat, mix of mature and young coniferous and deciduous forest. This purchase allows the protection of three "hot spots" for fish that might otherwise become problematic through undesirable land use practices, such as logging.

Location: McLeod Slough (at confluence of Skagit and Sauk Rivers)
Size: 150 acres
Seller: Private, small landowner
Description: Great lowland, riparian habitat with back channels that serve as prime salmon spawning habitat. Supports numerous species of birds and a diversity of terrestrial wildlife.

Location: Skagit River (near Illabot Slough)
Size: One 35 acre parcel, one 5 acre parcel
Seller: Two private, small landowners
Description: Lowland, wetland, deciduous forest. Used by a diversity of wildlife species, including bear, deer, waterfowl, and numerous species of birds.

Location: Skagit River (near Illabot Slough)
Size: 17 acres
Seller: Private, small landowner
Description: Lowland deciduous forest with a major back channel branching off the mainstem of the Skagit River. Used by a diversity of wildlife species, including bear, deer, waterfowl, and numerous species of birds.

Location: Off the mainstem Skagit River (near Illabot Slough)
Size: 1,700 acres
Seller: Aloha Lumber Company
Description: Upland, mixed deciduous/coniferous forest. This parcel serves to link SCL's mainstem Skagit River parcel (purchased in 1993) and a larger, protected "natural area preserve" owned and managed by the WA Department of Natural Resources. Combined with DNR's ownership, this large protected area covers approximately 4,000 acres.

Location: Sauk River
Size: 45 acres
Seller: Private, small landowner
Description: Situated on an island in the river, as the Sauk splits, with a major channel defining its west boundary and the Sauk River forming the east boundary. Mostly deciduous forest with a thick understory. Used heavily by bald eagles, which are attracted by large numbers of salmon carcasses. Protection of areas like this precludes the possibility of rip rap being placed along the bank for protection of structures, thus allowing the river to continue to meander within its channel.

Location: Sauk River
Size: 38 acres
Seller: Private, small landowner
Description: Nearly adjacent to the Sauk River parcel purchased in 1997. Possesses similar habitat characteristics.

Location: Sauk River
Size: 140 acres
Seller: Private, small landowner
Description: Mixed riparian forest with an estimated 18 acres of side channels. Provides habitat for juvenile chinook salmon and steelhead trout, spawning and juvenile coho salmon, and spawning pink and chum salmon. Used by a diversity of wildlife species, including bear, cougar, waterfowl. Excellent habitat for neotropical migrant bird species. Purchased in 2002.

Summary

Total acreage in South Fork Nooksack River basin	3,991

Total acreage in Skagit River basin (including Sauk)	4,278
Total acreage purchased to date	**8,269**

E. Threatened and Endangered Species Protection

1) Are threatened and endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?

Answer: **YES = Go to E2**

Terrestrial Species:
Bald eagle, grizzly bear, Northern spotted owl, and Marbled murrelet, all federally listed Threatened Species, are present in the project area. Peregrine falcon, and the Grey wolf, both federally listed Endangered Species, are present in the project area.

Aquatic Species:
Chinook salmon, which were listed as a threatened species by the National Marine Fisheries Service in 1999, are present in the Skagit River downstream of the project. Bull trout, which were listed as a threatened species by the U.S. Fish and Wildlife Service in December 1999. Bull trout are present in small numbers in Diablo and Gorge reservoir. Healthy populations of bull trout are present in the upper Skagit River basin above Ross Dam, and in the upper and middle Skagit basin below Gorge Powerhouse.

2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?

Answer: **Not Applicable = Go to E3**

Terrestrial Species:
Recovery plans for the listed species do not include recommendations specific to City Light's Skagit Hydroproject. The U.S. Fish and Wildlife Service (letter, August 10, 1994) concurred with FERC's determination of "not likely to adversely effect," relative to the relicensing of the Project by FERC. A copy of the letter is included with this application.

Aquatic Species:
Because of the relatively recent listing of chinook salmon and bull trout as Threatened Species in the Puget Sound region in 1999, recovery plans have not yet been developed for these listed species in this region. The recovery plan for chinook salmon in the Puget Sound is currently being developed by the Puget Sound Technical Recovery Team (TRT), and the recovery plan for bull trout is being developed by the Puget Sound Bull Trout Recovery Unit Team (RUT). Seattle City Light staff have been attending the chinook salmon TRT meetings, and will been actively involved in the implementation of NMFS recovery plans for chinook salmon by the lead watershed organizations in Skagit basin. Seattle City Light's ESA Coordinator for the Skagit

watershed is serving as a member of the Bull Trout Recovery Unit Team, and will be writing the chapter of the bull trout recovery plan for the upper Skagit River basin in partnership with the USFWS, Washington Dept. of Fish and Wildlife, U.S. National Park Service, and U.S. Forest Service.

3) If the Facility has received authority to incidentally Take a listed species through (I) having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?

Answer: **Not Applicable = Go to E5**

Chinook salmon and bull trout were listed as threatened species under the ESA in 1999. The listing of these species occurred after Settlement Agreement was completed and signed by the agencies and tribes in 1991, and following completion of relicensing in 1995. Formal consultation with the NMFS and USFWS pursuant to Section 7 of the ESA has not been required following project relicensing, because no changes to project operations have been proposed that would require a federal action (e.g., change in license conditions). Further, the NMFS and USFWS have opted not to re-open the license for the Skagit Hydroelectric Project to Section 7 consultation up to the present. Seattle City Light keeps in close contact with the ESA leads with the NMFS and USFWS to identify any possible questions regarding project operations on chinook salmon, bull trout, and bald eagles.

E. If E.2 and E.3. are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?

Answer: **Yes = Pass, go to F**

Seattle City Light implemented an intensive fish monitoring program in the 25-mile reach of the Skagit River downstream of the project as part of the Settlement Agreement, which is conducted in coordination with the agencies and tribes. This monitoring program provides "real time" verification that the instream flow management measures implemented under the Settlement Agreement provide high levels of protection to chinook salmon and other fish in the Skagit River below the project. The results of this ongoing monitoring program provide excellent evidence that the project facility and project operations do not negatively affect chinook salmon and other salmon species downstream of the project. Moreover, data from annual spawning surveys conducted by the WDFW indicate that the modified flow regime has had a long-term beneficial effect on salmon populations spawning below the project.

Chinook salmon populations in the 25-mile reach of the Skagit River below the project have remained stable and healthy following the implementation of the Settlement Agreement, while chinook populations in other reaches of the Skagit River basin have been declining over this

same time period. The Skagit River basin possesses the largest and healthiest run of native chinook salmon in the Puget Sound, and almost 80 percent of the chinook in the Skagit basin spawn in the 25-mile reach downstream of the project (WDFW et al. 1993). The flows implemented in the Skagit River under the Settlement Agreement have resulted in substantial increases in the number of pink and chum salmon spawning in 25-mile reach below the project (Olsen and Knutzen 1997; Connor and Pflug *In Press*). This 25-mile reach supports the largest number of pink and chum salmon spawners in the Skagit Basin, a basin that possesses the largest runs of pink and chum in the coterminous United States.

Based upon the results of recent research studies, we believe that project operations do not negatively affect bull trout populations in the Skagit River below the project, and in the upper Skagit River basin above Gorge Dam (including Gorge, Diablo, and Ross Reservoirs). The bull trout population in the Skagit River drainage below the project has been identified as the largest and healthiest in the Puget Sound region. The Skagit River most likely supports the largest bull trout population in the State of Washington.

Seattle City Light has been conducting ground-breaking research for the past three years on bull trout populations in the upper Skagit River above Ross Dam in partnership with the National Park Service (North Cascades National Park Complex), U.S. Forest Service, and British Columbia Ministry of Water, Land, and Air Protection. This research is being conducted to better understand the life history, habitat requirements, and migratory behavior of bull trout in Ross Lake and the upper Skagit River drainage. The results of this joint research project will provide the key biological information required for the development of the recovery plan for bull trout in the upper Skagit Watershed.

Bull trout are a native fish species found in the upper Skagit River Watershed. Bull trout were listed as a Threatened Species under the provisions Endangered Species Act by the U.S. Fish and Wildlife Service (USFWS) in 1999, and are designated as a "Vulnerable" species (Blue List G3) by the British Columbia Ministry of Lands, Environment, and Parks. Three different life history forms of bull trout are present in the upper Skagit River drainage above Ross Dam: 1) resident forms, which spend their entire lives in headwater streams; 2) fluvial forms, which reside as adults in larger rivers and stream and then spawn and rear in smaller tributary streams; and 3) adfluvial forms, which reside in lakes as adults and spawn in tributary streams and rivers. Adfluvial bull trout are present in Ross Lake, and likely became established in this reservoir from fluvial fish originating from Skagit River and tributaries following completion of the dam and filling of the reservoir in 1951.

Bull trout in Ross Lake attain relatively large sizes, with adults ranging from 40 to 90 cm (16 to 35 inches) in length. Adfluvial bull trout typically reside as juveniles in tributary streams for two to three years prior to migrating to a lake. These fish then migrate downstream into the reservoir, and become sexually mature at five to six years of age. Adfluvial bull trout typically become piscivorous (fish predators) prior to maturity, and prey upon rainbow trout and other fish species within Ross Lake. Bull trout in Ross Lake have a lifespan that probably exceeds 10 years.

The results of the bull trout research project suggest that bull trout are abundant in the upper Skagit River drainage including Ross Lake. The upper Skagit River drainage possesses excellent habitat conditions for bull trout, including cold water temperatures in Ross Lake and tributaries (many which are glacially fed), an abundant food supply (i.e., smaller rainbow trout), and good access to high quality spawning and juvenile rearing areas in the upper watershed. Based upon the results of radiotelemetry and tagging studies, the number of adult bull trout in the upper Skagit River drainage including Ross Lake exceeds 1000 individuals. Ross Lake provides migratory bull trout access to two major drainage systems, Big Beaver Creek and Lightning Creek, that were not accessible to upstream migration due to natural barriers (bedrock falls) prior to the filling of this reservoir.

Based upon the results of radiotelemetry and tagging studies to date, we have found that the majority of bull trout in the Ross Lake are highly migratory and possess dynamic life history patterns (e.g., individuals will spawn in different tributaries from one year to the next). There appear to be high levels of genetic interchange among bull trout spawning areas within the upper Skagit River as a result these dynamic life history traits that provide a high level of population stability over time. This hypothesis will be tested by genetic analysis proposed for the 2003 and 2004.

SCL implemented a monitoring program to identify potential impacts of reservoir drawdown on the upstream migration of spawning bull trout. The upstream migration of adult bull trout from the reservoir to their spawning areas in the upper tributaries does not appear to be adversely affected by project operations under most hydrological conditions. During drought years such as 2001, the migration of spawning bull trout may be temporarily blocked by early reservoir drawdown in those tributaries including Lightning Creek and Big Beaver Creek that were naturally inaccessible prior to the construction of the Ross Dam. Radiotelemetry studies of conducted in Ross Lake during the drought of 2001 found that adult bull trout will migrate to other tributaries to spawn in the presence of upstream migration blockages (e.g., waterfalls) formed during early drawdown.

SCL this year initiated a study of bull trout populations in the 25-mile reach of the Skagit River downstream Gorge Powerhouse in the partnership with the Washington Department of Fish and Wildlife. Even though the Skagit River possesses the largest and healthiest population of bull trout in the Puget Sound (WDFW 1998), relatively little is known regarding the life history, habitat requirements, migratory behavior, and genetic characteristics of bull trout in this watershed. This study will be used to better understand ecology, spatial distribution, population trends, and potential effects of project operations on this threatened species. The major factors contributing to the high abundance of bull trout in Skagit River include cold water temperatures, excellent habitat conditions for spawning and juvenile rearing in the tributaries, and access to highly productive foraging areas including the mainstem river below the project.

In addition to flow improvements for fish provided under the Settlement Agreement and FERC license conditions, SCL implemented the Endangered Species Act "Early Action Program" to protect and restore chinook salmon and bull trout habitat in the Skagit River Basin. This voluntary program was initiated in 2000, and provides funding for acquiring high quality salmon

and bull trout habitat, as well as restoration of habitats including estuary areas in the Skagit River delta that are important to the recovery of these listed species. Since its inception, this program has resulted in the permanent protection of almost 400 acres of exceptional habitat for chinook salmon and bull trout. It has also provided funding for tributary, side channel, and estuary habitat restoration projects in the Skagit basin.

The Skagit supports one of the largest overwintering populations of bald eagles in the lower 48 states. They are drawn by the large number of spawning salmon that use the river; they feast on the carcasses after the salmon have spawned. Over 300 birds have been counted on the river.

In May, 1994, a Biological Assessment was conducted to determine the potential impacts to listed species posed by license issuance by FERC. The species addressed in the assessment included: Peregrine falcon, Bald eagle, Northern spotted owl, Marbled murrelet, Gray wolf, and Grizzly bear. The FERC made a determination that, for each species considered, licensing, operating and maintaining the Skagit Hydroproject, under the terms of the full Settlement Agreement, and with FERC's recommended measures, would not likely adversely affect these species. The U.S. Fish and Wildlife Service (letter August 10, 1994) concurred with the FERC's determination.

F. Cultural Resource Protection

1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?

Answer: **YES = Pass, go to G**

As a part of its FERC license for the Skagit hydro project, SCL has been implementing the April 1991 Settlement Agreement Concerning Cultural Resources (Archeological and Historic Resources). This Agreement is between the City of Seattle and the U.S. Department of the Interior (National Park Service), Upper Skagit Tribe, Sauk-Suiattle Tribe, and the Swinomish Indian Tribal Community. SCL also entered into the Settlement Agreement on Traditional Cultural Properties. This Agreement includes the Traditional Cultural Properties Mitigation Plan and provides that SCL will make available approximately $4 million dollars for Traditional Cultural properties.

Historic resources: Projects that have been completed include: documentation of important engineering and architectural resources, completed to HABS/HAER standards; an Historic Structures Report for Gorge Inn and Cambridge House; the Ladder Creek Falls Trail Historic Landscape Report; Skagit Maintenance Guidelines; Historic Photograph Conservation; the Newhalem Walking Tour brochure; and the HABS/HAER publication. Work is well underway on interpretive exhibits that will interpret the history of the Project for visitors.
In acknowledgement of SCL's success in developing a comprehensive mitigation and management plan for the Skagit's historic resources, SCL received the State Historic Preservation Officer's 1993 Annual Award for Outstanding Achievement in Preservation Planning (Washington Department of Community Development, letter April 16, 1993).

Archaeological/prehistoric resources: SCL has been working in close cooperation with the North Cascades National Park to complete survey, testing, and evaluation of archaeological sites in the vicinity of Ross Lake and to report the findings. The National Park Service is administering most of the work and, with SCL funding, published a 600-page report on work in the Ross Lake area. This report has been praised for its new contributions to knowledge about use of the area over the past 10,000 years. A determination of eligibility for 16 sites has been prepared and will soon be submitted to the Washington State Office of Archaeology and Historic Preservation. Further determinations of eligibility will be considered if additional sites are identified. A management plan for treatment of the National Register-eligible sites is currently in draft form.

Traditional Cultural Properties: SCL is in compliance with license provisions for payments to the tribes for cultural resource mitigation. SCL's payments will be used for improvements and construction of longhouses and other tribal buildings, work with the Skagit Historical Museum and schools, a Hunting Management Plan with the State, work done by a cultural resources specialist, archaeological work and a resource coordinator. SCL is also conducting a study of contact between the builders of the Project and the tribes. SCL's agreement with the tribes allows each tribe to select and hire its own investigator to research and document traditional cultural

properties. The work is proceeding with SCL funding according to a schedule determined by the tribes. This approach has not been used often (more commonly, the utility hires a consultant who reports to the utility). Our approach is working to build mutual respect as we learn from each other. We place high priority on our relationship with the tribes, and we are proud of our good track record.

G. Recreation

1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?

Answer: **YES = Go to G3**

The Skagit Settlement Agreement on Recreation and Aesthetics (Visual Quality), April 1991, outlines SCL's FERC license obligations. The Settlement includes a Recreation Plan and a Visual Quality Mitigation Plan, and a separate Memorandum of Agreement for the largest element of the recreation plan, the North Cascades Environmental Education Center. SCL is in compliance with the requirements of this Settlement Agreement. Extensive consultation with agencies and groups such as the National Park Service and the North Cascades Institute has occurred in the planning and implementation phases of many projects.

The Recreation Plan provides that SCL will continue existing programs and implement new mitigation and enhancement projects. Continuing efforts include the existing Skagit tours, which serve approximately 10,000 people per year, operating the Diablo Lake tugboat/ferry service which provides access to Ross Lake and Ross Lake Resort for hundreds of people per year, maintaining picnic and playground facilities open to the public in Newhalem and Diablo, maintaining the Ladder Creek Falls trail behind the Gorge Powerhouse, and maintaining/replacing the electricity supply to Colonial Creek Campground. Seattle City Light suspended the Skagit Tours during 2002 for security reasons. Security issues were assessed during this time period and plans are being made to renew the tours in 2003. They will probably not be identical to the previous tour, but should still include an emphasis on environmental stewardship and information about the upper Skagit area.

Measures to mitigate the impacts of operating the Project on Ross, Diablo, and Gorge lakes includes increasing the ability of boaters to access Ross Lake at Hozomeen by extending the ramps to a lower elevation, increasing accessibility of Ross Lake boat-in campgrounds by improving their docks, and improving accessibility of Diablo and Gorge lakes by improvements of boat ramp facilities on each reservoir.

Completed recreation enhancement projects include the Goodell Creek raft site, Damnation Creek Boating and picnic site, final landscaping for the Hozomeen boat ramp, remodel of the Hozomeen boathouse, improvements at Little Beaver, Green Point, and May Creek campgrounds (docks, animal-proof storage, new tent pads), Gorge Creek Overlook trail including a significant handicapped-accessible portion, and installation of a solar-powered bicycle safety light at the Highway 20 tunnel.

Future recreation enhancement projects include an accessible fishing site at Thunder Creek, trail construction and revegetation, and constructions of boat access sites at the lower Sauk and Suiattle Rivers, and a Recreational Needs Assessment.

The most significant new recreational facility to be funded by SCL is the North Cascades Environmental Education Center. The facility will have roughly 27,400 square feet of new buildings, including three dormitories with a total of 44 beds, seven two-bedroom staff housing units, office space, a library, two labs, a classroom, a maintenance building and a bear-proof structure for garbage and recycling. The existing restaurant will be remodeled and added on to for use as a new dining hall with seating for 78 people plus a seminar kitchen/dining area, for a total of over 5,000 square feet. There will also be an outdoor amphitheater, a dock, a covered shelter and new trails. We have arranged to compensate the NPS for collection and propagation of native plants for site landscaping and restoration. In 2002 we selected a contractor and construction is underway. The North Cascades Institute will operate extensive environmental education programs at this facility, including classes and programs for school children, teachers, and seniors.

In 2001, SCL built a new Information Center at Newhalem and installed interpretive exhibits at several locations at the Project. SCL selected a consultant to do detailed display planning for the Information Center and other Skagit locations (Diablo and Ross Powerhouse, the Incline Lift waiting area, the Gorge Powerhouse overlook, and the Main Street Terminus parking area).

A Landscape Master Plan, outlining improvements in directional signage, parking, visitor circulation and access to Project amenities for the public was completed in 1998. Construction and installation of newly designed landscape features was completed in 2002. This included restoration of areas to native vegetation, construction of an ADA-accessible trail in Newhalem, upgrading of parking areas, and construction of new visitor contact points. SCL will also continue to improve the visual quality at the Facility. The transmission lines and rights-of-way, primarily of concern along State Route 20 and the Skagit Wild and Scenic River, will be improved through the Rights-of-Way Vegetation Management Plan, which allows greater vegetation growth than in the past. Appropriate native trees and shrubs are being planted at seven target areas identified in a visual quality study, and photo documentation is being conducted. Elements in the Erosion Control Plan, such as planting vegetation and placing earth and rock to discourage shoreline erosion, also mitigate visual quality impacts. Although not a requirement of the Settlement Agreements, SCL continues to work with NPS, TNC and local weed boards on removal of non-native, invasive species such as scotch broom, Japanese knotweed, knapweed, etc.

Recreation Project List

Under Recreation programs, the pace of work continues to accelerate as we move into construction on some projects while still performing design and environmental review on others

- The Damnation Creek boat-in picnic site on the Skagit River was completed, including installation of picnic tables, trail to vault toilet, and vault toilet.
- The Gorge Creek Overlook project was completed, including a loop trail with a fully accessible portion going to a lookout over Gorge Dam. Interpretive signs, handrails, new parking, and vault toilets were also part of this project
- At Hozomeen on Ross Lake, the parking area was expanded, a new Romtec toilet was provided, and shoreline improvements were made near the boat ramp. Enhancements in the

vicinity of the Hozomeen boat ramp were completed in 2000 (including the picnic shelter). Final landscaping took place in the vicinity of the Hozomeen boat ramp in 2001.

- Ross Lake campgrounds : A new dock at Lightening Creek was completed; also reconditioning, including dock bulkhead and dock, animal-proof storage containers and site rehabilitation, and picnic table reconditioning..
- The Goodell Creek Raft Access site on the Skagit River was completed, including a sandblasted design on the floor of the new shelter.
- Colonial Creek boat ramp New dock section rub rails and pontoons were installed on Diablo Lake, and other dock repairs were made.
- A draft bicycle needs assessment was completed in 2001. SCL installed solar power for a bicycle-warning signal at a hazardous tunnel between Newhalem and Diablo, and paid for equipment installed by the Washington State Department of Transportation.
- A contractor finished installing a new 20,000-gallon water tank at Hozomeen, the intake has been improved, and the road to the tank was regraded .
- Accessible fishing facility: Environmental compliance and design work are proceeding at this Diablo Lake site.
- Thunder Knob trail was completed in 2001.
- Marblemount boat launch site for the Skagit River was completed, with a large new parking area and new trail. Much new planting occurred at the Marblemount boat launch for the Skagit River.
- Rehabilitation work is underway at Mineral Park Campground.
- Planning underway for the Steelhead Park boat launch and the Steelhead Park trail.
- Most work at the Lower Sauk boat launch site was completed, with a new parking area and revegetation.

- North Cascades Environmental Learning Center (NCELC) -- SCL signed an agreement with the NPS to fund expansion of their greenhouse facilities, seed collection, and plant propagation for the new ELC. SCL also funded tree clearing and thinning at the site. SCL signed an agreement with the NPS to fund creation of new trails and outdoor learning areas. SCL provided funds to NCI for purchase of furnishings for the NCELC. SCL signed an agreement with the NPS to fund creation of new trails and outdoor learning areas. SCL provided funds to NCI for purchase of furnishings for the NCELC. Plans and specifications went through several rounds of review. Whatcom County issued a shorelines permit in the spring and construction permits at the end of December 2000. The plans and specifications for construction were advertised for bids. A consultant prepared a plan for installation of telecommunications lines and equipment. Construction began in spring, 2002.

- SCL completed construction and landscaping of a new Skagit Information Center in Newhalem and worked with a consultant on further development of interpretive displays. The information center was opened to the public in 2001 with temporary displays. A sculptor created an outdoor sculpture of spawning salmon. Interpretive signs were designed for the Thunder Knob Trail, Goodell Raft Launch and the River Loop Trail, plus signs detailing accessibility for all accessible trails along or near SR 20. An interpretive master plan for the

Wild-and-Scenic River system was completed and a feasibility study was begun for a new interpretive center related to the watershed. The USFS used funds for interpretive walks and talks, support to the bald eagle festival including staffing and a brochure, eagle counts, portable toilets, recreation surveys, and maintenance of interpretive signage.

3) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?

Answer: **Yes = Pass, go to H**

H. Facilities Recommended for Removal

1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?

Answer: No = Pass, Facility is Low Impact

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INDEX OF ATTACHMENTS
(Prepared by the Low Impact Hydropower Institute)

Attachment A—Skagit Project Photographs –Seattle City Light
(These photos are included on the LIHI website)

Attachment B—Skagit Watershed: City of Seattle Salmon Habitat Projects and Wildlife Lands
(This narrative and map are included on the LIHI website)

Attachment C—Seattle City Light Skagit Habitat Land: Photos by Keith Lazelle
(These photos were not available for reproduction on the website and so this attachment will not be considered in the evaluation of the project for certification)

Attachment D—Federal Energy Regulatory Commission: Inspection Report for the Seattle City Light Skagit Project—January 12, 2001
(This inspection report is available on the LIHI website)

Attachment E—FERC Reports for the Skagit Hydroelectric Project—Seattle City Light
(This attachment includes the following reports; reports underlined are available on the LIHI website; all others are available upon request to LIHI):

2001 Expenditures Statement (EXCEL Spreadsheet and WORD Narrative)

2003 Expenditures Plan (EXCEL Spreadsheet and WORD Narrative)

2001 Wildlife Annual Report (WORD document)

1999_2000 Historic Resources Report (WORD document)

2001 Erosion Control Report (WORD document)

Annual Non-Flow Program Reports (WORD document)

Semi-Annual Flow Compliance Report (paper copy)

Recreation Report FERC Form 80 (paper copy)

Skagit River Bald Eagle - Seattle City Light Transmission Line Interaction Study (paper copy)

(References: all the references listed in Seattle City's Light's application are available on request from LIHI with the exception of the Connor paper, which is in press.)