

IV. Core Elements

➤ HYDROPOWER

Hydropower and Fish: Pursuing Opportunities

I. Current Situation: *Where are we now?*

Background

Hydropower dams and facilities have had profound negative impacts on river systems and on anadromous fish. Chapter II. Background: Setting the Context briefly describes the adverse effect of hydroelectric development on salmon populations and their habitats. There are, unfortunately, no simple fixes and there is considerable resistance to fixes that would reduce power production.

Hydropower facilities fall into three general groups -- federal, non-federal FERC licensed projects, and non-federal projects that are not licensed by FERC. About 60% of the total hydropower capacity in the state of Washington comes from federal dams constructed and operated by the U.S. Bureau of Reclamation (USBR) and U.S. Army Corps of Engineers (USCE) on the Columbia-Snake River system. Bonneville Power Administration (BPA), a federal agency within the U.S. Department of Energy, essentially manages the river by coordinating operations of the Columbia-Snake River system's major dams owned and operated by the U.S. Army Corps of Engineers, (*Bonneville, The Dalles, John Day, McNary, Chief Joseph, and the four lower Snake dams- Ice Harbor, Lower Monumental, Little Goose and Lower Granite - in Washington; Hungry Horse in Montana; and Dworshak in Idaho*), and the U.S. Bureau of Reclamation (*Grand Coulee in Washington and Libby in Montana*).

Non-federal hydroelectric dams are generally operated by private developers, stockholder-owned utilities, municipal utilities, or public utility districts. Under the Federal Power Act (FPA), the federal government regulates most of the non-federal hydroelectric projects. BPA coordinates, however, the operation of three mid-Columbia Public Utility Districts' dams, (*Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids*) as part of the Columbia-Snake River system.

Nearly all non-federal dams must be licensed by the Federal Energy Regulatory Commission (FERC). FERC is an independent regulatory agency within the Department of Energy. It is designated by Congress to carry out the provisions of FPA and to oversee the construction and operation of hydroelectric projects. Modifying the operations at federally licensed hydroelectric projects is also done through FERC. FERC issues licenses for hydroelectric projects for a period of 30 to 50 years.

A few non-federal projects are not licensed by FERC, either because FERC has determined that it does not have jurisdiction over the project, or the project is exempt

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(generates less than 5 Mega-watt, or it is located on a non-navigable water body), or it was constructed prior to the passage of the Federal Power Act and no modification was made to the project (e.g. Electron dam on the Puyallup river).

More than 80 FERC licensed hydropower projects are operating in Washington State. Many of these licenses are expiring and must be renewed in a process known as re-licensing. Specifically, twenty-two dams, or 14 projects (not all of these are in salmon habitat) have licenses due to expire between now and 2010 and will be subject to the re-licensing process. Re-licensing is a process similar to licensing a new project. When these licenses expire, a licensee who wishes to continue operation of the project must apply for a new license. The licensee is required to submit a final license application two years before the actual expiration date of the license. The licensee must consult during the proceeding with state and federal resource agencies, tribes, and the public.

New license proceedings are an avenue to implement environmental improvements at hydropower projects. The proposed continued operation of a project must be evaluated in light of current laws and regulations (most of today's environmental laws and regulations did not exist at the time many projects were constructed). The process of relicensing hydropower dams has resulted in improvements at several dams through higher instream flows, restoration of flows to de-watered by-pass reaches, fish passage facilities, protection of riparian habitat, and establishing mitigation and restoration trust funds.

The licensing process must comply with the Federal Power Act, the National Environmental Policy Act (NEPA), the Fish and Wildlife Coordination Act, the Clean Water Act, the Northwest Power Act and several other federal statutes (see section B). The Endangered Species Act (ESA) imposes substantive requirements on FERC to protect species listed as threatened or endangered: any proposed action that is likely to jeopardize a listed species or adversely affect its critical habitat requires FERC to consult with the appropriate federal agency, USFWS or NMFS. Modifying the operation at non-federal and non-FERC licensed project can be done using state laws for water quality, instream flows and fish passage and federal fish and wildlife laws.

While the focus of this paper is on the use of FERC licensing process to achieve the stated goal, it is important to note that an applicant could choose to develop a Habitat Conservation Plan (HCP) under section 10 of ESA. Under section 10, the USFWS and NMFS are authorized to issue Incidental Take Permits to applicants who satisfy the requirement of ESA. In the development of HCPs, the state plays a very important role in the negotiations between NMFS, USFWS, tribes, FERC, EPA, State, hydropower project applicants and non-governmental organizations (e.g. American Rivers Inc. is party to the Mid-Columbia HCP agreement).

The following is a brief description of the Mid-Columbia Habitat Conservation Plan. Some components of the agreement can be used in other hydropower HCPs.

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Mid-Columbia Habitat Conservation Plan

The non-federal hydropower projects within the Columbia-Snake River system (three mid-Columbia Public Utility Districts) are subject to requirements of FERC licensing, the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), the Fish and Wildlife Coordination Act, the Northwest Power Act and state authority under the Clean Water Act, and the Federal Power Act. Development of Habitat Conservation Plans (HCPs) under section 10 of ESA are being negotiated by the mid-Columbia PUDs to meet the requirements of ESA and FERC licensing.

In June 1998, Chelan and Douglas Public Utility Districts (PUDs) entered into an Anadromous Fish Agreement and Habitat Conservation Plan (HCP) with co-managing federal and state fishery management agencies and tribes¹, power-purchasers, and American Rivers, Inc., a non-profit environmental group. The objective of the agreement is to achieve 100% No Net Impact (NNI) for anadromous salmonids² affected by Wells, Rocky Reach, and Rock Island dams on the Columbia River. When the agreement becomes effective, the two PUDs will receive an Incidental Take Permit for the species covered in the planned 50 year FERC license.

The goal of NNI must be achieved in a manner that is compatible with self-sustaining natural populations. The primary means to achieve NNI is to ensure a high survival rate of fish passing through the three reservoirs and project structures. However, some impacts will be unavoidable or extremely difficult to mitigate. Measures taken by the Mid-Columbia PUDs to improve natural production of anadromous fish in the region will compensate for mortality in project and reservoir passage. Two strategies will be used: (1) habitat protection and restoration, and (2) hatchery production of affected species in the mainstem mid-Columbia River and its four major tributaries: the Wenatchee, Entiat, Methow, and Okanogan watersheds.

Passage Program.

The goal of the passage program at each dam is to achieve 91% passage survival within the geographic area of each hydroelectric project, by a combination of project improvements and management actions. Within this overall 91% survival goal is an independent standard of 95% juvenile downstream migration survival at each project. To compensate for the remaining 9%, the PUDs will fund two programs for the duration of the agreement (1) a hatchery program in the region to contribute to the rebuilding and recovery of naturally spawning populations and to compensate for unavoidable losses, and (2) a program (funding) to protect and restore salmonid habitat in areas upstream of the hydroelectric projects and to compensate for mortality at the dams.

¹ *The co-managing fishery parties include the U. S. Fish and Wildlife Service, the U. S. National Marine Fisheries Service, the Washington Department of Fish and Wildlife, the Colville Confederated Tribes, the Yakama Indian Nation, and the Confederated Tribes of the Umatilla Indian Reservation.*

²*Plan Species are chinook salmon, steelhead, sockeye salmon, and coho salmon.*

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Statewide Strategy to Recover Salmon – Extinction is Not an Option
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Current Applicable Policies

Congress, in enacting several laws specific to hydropower, has determined that some basic environmental protection must be afforded at every dam, and should not be balanced away to promote hydropower.

- Pursuant to Section 10(j) of the Federal Power Act, as amended by the Electric Consumers Protection Act, state and federal resource agencies (e.g. U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife and NMFS) may recommend that certain fish and wildlife protection measures are included in a new license. FERC is required to give these recommendations due consideration and must adopt them unless FERC finds them inconsistent with the Federal Power Act. FERC is required to hold a dispute resolution meeting to resolve disagreements between the resource agencies and FERC.
- Under Section 10(a) of the Federal Power Act, FERC must give “equal consideration” to power and non-power values. In doing so, FERC must consider the extent to which a project would be best adapted to a comprehensive plan for developing a waterway. FERC need not act consistently with a comprehensive plan, but must justify a decision not to. The state’s primary comprehensive plan is the Washington State Hydropower Development and Resource Protection Plan, completed in 1992.
- Under Section 4(e) of the Federal Power Act, FERC must include measures prescribed by the agency responsible for managing a federal reservation (e.g. a national forest) upon which part of a project resides.
- Under Section 18 of the Federal Power Act, both the Department of Interior (acting through USFWS) and the Department of Commerce (acting through NMFS) may prescribe up and downstream fish passage measures at a hydroelectric project. These prescriptions are mandatory.
- FERC generally preempts state laws and regulations. For example, hydroelectric licensees are not required to obtain hydraulic project approvals (HPAs) from the state Department of Fish and Wildlife. One exception is that the state water pollution control agency (in Washington State, the Department of Ecology) may require mandatory conditions on hydroelectric projects via issuance of a water quality certification pursuant to Section 401 of the federal Clean Water Act. The state has broad discretion to require measures, which are necessary to sustain a designated use of a water body (e.g., salmonid migration, rearing, spawning and harvesting).
- In addition, the Department of Ecology (Ecology) believes it has authority to condition water quality certifications (under section 401 of the federal Clean Water Act) with new, generally higher, instream flow requirements, even on long-existing hydropower projects with state water rights. Hydropower project owners disagree. Pend Oreille Public Utility District has filed an appeal of Ecology’s decision to condition a water quality certification for its Sullivan Creek project with instream

flow requirements higher than those on an existing water right. The outcome of this litigation will significantly determine the state's ability to influence and modify the operation of hydroelectric projects during licensing proceedings in which the license already holds existing water rights. It is Ecology's view that the United States Supreme Court already has upheld Ecology's authority in this regard. In a 1995 opinion, the court held that,

“Sections 101g and 510(2) (of the Clean Water Act) preserve the authority of each state to allocate water quantity as between users; they do not limit the scope of water pollution controls that may be imposed on users who have obtained, pursuant to state law, a water allocation.” (Jefferson County PUD et. al. v. Ecology).

- Pursuant to the federal Coastal Zone Management Act, the state may object to a project that affects coastal resources under the state’s federally approved Coastal Zone Management Program (CZMP). For projects within the CZMP boundaries, the state also may require the applicant to comply with state shoreline permitting laws. While the Coastal Zone Management Act allows the state to either object or concur that a project is consistent with the Coastal Zone Management Program, it does not allow the state to issue a conditional determination.
- For non-federal projects not licensed by FERC state laws apply. This includes state fish passage and screening laws, described in the chapter on barriers, instream flow laws, described in the chapter on ensuring water for fish, and water quality laws.

Overview of Chapter

The strategy for hydropower projects is to use the FERC, process and state existing laws and state authority under the Clean Water Act to pursue modification of the operations at hydroelectric projects federally and non-federally licensed, to implement salmon protection, mitigation and enhancement measures. In areas where FERC licenses are also subject to the ESA’s substantive requirements to protect and restore species listed as endangered or threatened, the state will actively pursue immediate modification necessary to prevent further harm to the species. The state will also pursue opportunities to evaluate and recommend removal of dams that have become obsolete and/or are more expensive to repair/upgrade than to remove.

Hydropower issues within and outside the Columbia-Snake River system (all federal and non-federal hydropower projects above Bonneville dam) are addressed differently due in part to the different governance arrangements.

- The state responsibility for hydropower projects not located within the Columbia basin is carried out by the state resources agencies (e.g. Ecology, WDFW).
- Within the Columbia basin the regional Northwest Power Planning Council, consisting of two members each from Washington, Oregon, Idaho, and Montana, helps to oversee fish recovery measures in the Columbia-Snake system.

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Washington's members, together with other state agencies' staff, are responsible for advising the Governor and meeting with constituencies on all issues pertaining to the operation of the dams. The Council members are part of the Joint Natural Resources Cabinet.

The part of this chapter covering the Columbia River Basin Hydropower System is mainly a very brief summary of issues and strategies and it is not intended to be a policy section. A separate process is in place for the Columbia River Basin and is coordinated with the Statewide Strategy to Recover Salmon.

II. Goal and Objectives: *Where do we want to be?*

Goal:

Achieve *No Net Impact* for each species affected by hydropower projects

Objectives

- Restore or improve fish passage, implement less disruptive water release schedules, ensure that projects meet water quality standards, and mitigate habitat loss and degradation.
- Use the state's existing authority to reduce and mitigate impacts of dams on fish and to prevent taking of fish under Endangered Species Act.
- Hold hydropower project owners responsible to ensure that projects meet the goals and objectives of the Statewide Strategy to Recover Salmon.

III. Solutions: *What is the route to success?*

FERC License proceedings will be used by the state resources agencies (Ecology, WDFW, and others) to require environmental improvements at a project. While FERC authority generally pre-empts state laws and regulations, the state will use the FERC proceeding, state laws and state authorities under federal legislation -- the Clean Water Act, Coastal Zone Management Act and Federal Power Act -- to achieve the stated goal and objectives.

The mandatory conditioning authorities included in the Federal Power Act and the Clean Water Act are among the most significant tools to protect, mitigate and enhance the impacts of hydropower facilities. Three basic mandatory protection requirements (see above for statutory authority) assure that:

- 1) Fish can migrate upstream and downstream of a dam when necessary;
- 2) That a dam does not result in a violation of state water quality standards; and
- 3) If a private dam is located on federally owned land, the uses of the federal land are protected.

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These basic protections are implemented based on state, tribal, and federal agencies' recommendations or conditions to mitigate the effects a hydropower facility has had on salmon.

The state through the Departments of Fish and Wildlife and Ecology will exercise its discretion in a manner broad enough to address the many ways in which dams degrade salmon habitat. The state resource agencies will work closely with tribal and federal resource agencies (e.g. NMFS and USFWS) in developing appropriate operating conditions. The state agencies will commit the resources necessary to accomplish this and will base their decisions on the biological needs of the resource.

In addition, the state through the Department of Trade and Economic Development (CTED) and the Governor's Office will ensure that any deregulation of the electricity market does not undermine anadromous fish recovery efforts. Hydropower operators should be responsible for mitigating and minimizing the environmental impacts of their activities without regard to other regulatory issues that they may face in the future.

The state will also continue to work with other states through the National Governors Association (NGA) and the Western Governors Association (WGA) to oppose any amendments by Congress to limit state and federal agency mandatory conditioning authority, and to arrive at a coordinated procedure for dealing with certification of FERC licensed projects under Clean Water Act section 401 and the Coastal Zone Management Act.

State Actions on New Hydropower Projects

The state through its resources agencies, Ecology, WDFW and others as appropriate, will oppose all proposals for new hydroelectric projects with the potential for degrading salmon habitat and will use the authorities referenced in section B above in an appropriate manner. The agencies will base their opposition and any denial of water quality certification on ESA listing, the Protected Areas designation developed by the Northwest Power Planning Council and the Washington State Hydropower Development/Resource Protection Plan.

There are 16 new proposed projects mostly in the Nooksack, Skagit and Okanogan basins, where species have been listed or proposed for listing. Most of the projects are proposed in "protected areas" and are not as economically attractive as when they were first proposed (1980s). Additionally, FERC staff is recommending against licensing most of them.

State Actions on Existing Hydropower Projects under Re-licensing

As stated before, many of the licenses issued in Washington either expired or will expire by 2010. There are 22 dams (14 projects) that will require a new license by 2010. Nine of these projects have already started the re-licensing process and consultation. Except for the mid-Columbia PUDs no other applicants are developing HCPs, instead they are all pursuing new FERC licenses. The state will however, use the outcome of the mid-Columbia Habitat Conservation Plan (HCP) agreement as the minimum acceptable

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standards when making recommendations or requiring conditions to restore and mitigate impacts of hydropower projects.

The re-licensing of all of the projects is allowing the state and federal agencies to review the project under current conditions and requirements. The actions outlined below will be pursued for each project. For projects that have not started the re-licensing process, the state will use the re-opener clause to address impacts of the dams on anadromous fish, especially in areas with existing and potential listing under ESA.

The FERC licensing process has been at times very contentious and can take a long time (e.g., 10 – 24 years). For example, it took FERC 24 years to issue a new license for Cushman project on the North Fork Skokomish River in Mason County, and many years of litigation over the terms of the license are expected. Unfortunately, delay in re-licensing could be damaging to the salmon and the environment, as it would delay mitigation of adverse impacts of projects. Project owners have little incentive to resolve resource disagreements because FERC automatically issues annual license renewals which extend status quo operating conditions pending a final licensing decision. This, in effect, rewards project owners for failing to negotiate in good faith by allowing them to defer mitigation costs.

To improve river conditions and provide faster re-licensing, most utilities and federal and state agencies are now using an “alternative” re-licensing process. The emphasis is on collaboration, increased interaction with state agencies and other stakeholders, and on reaching settlement. While this process is still experimental, it has the potential for resolving licensing sooner and, hence, resulting in earlier implementation of environmental improvements. But also it is possible that long-standing disagreements over resource management, and reluctance by project owners to bear full mitigation costs, could continue to result in a process fraught with conflict, delay and litigation. In addition, at the national level the hydropower industry continues to lobby for amendments to the Federal Power Act and other environmental statutes (i.e. Clean Water Act) that would effectively preclude any resource agency -- state or federal -- from exercising mandatory authority over a FERC-licensed hydroelectric project. This suggests that, notwithstanding statements in favor of increased collaboration, the industry continues to believe and advocate for policies that would ensure the primacy of power values over environmental values.

The state actions for projects under re-licensing are the following:

- WDFW and Ecology will collaborate with FERC, EPA, NMFS, USFWS and other federal agencies to support the use of the “alternative” re-licensing process for all projects being re-licensed, to assist in achieving a settlement between all parties for FERC approval. The state supports efforts going on among states and federal agencies to arrive at a coordinated procedure for dealing with 401 and CZMA certification for FERC projects. The state will more likely adopt the policies and procedures that come out of that effort.

- While the state resource agencies will work cooperatively with federal agencies, hydropower applicants and non-governmental organizations, there is a need to take *immediate actions*. These actions are needed if changes in hydropower operations are necessary for the survival and recovery of listed anadromous species. The state will use any and all available tools at its immediate disposal to achieve those changes. The state through its resource agencies will petition FERC for changes to be included in the "annual license" issued by FERC pending the relicensing proceeding or will petition FERC to use the consultation requirement and takings prohibition under ESA to address any necessary changes.
- WDFW and Ecology in cooperation with others will identify the dams that have significant impacts on anadromous fish populations and the specific problems at those dams, such as blocked passage or low flows. Specific strategies to pursue mitigation and restoration actions will then be identified to address the impacts at each dam, based on the severity of harm to anadromous fish, the limiting factors analysis and the conditions of the watershed. The information will be provided to the regional recovery groups to use in identification of key limiting factors.
- Resource agencies will encourage applicants in areas with more than one hydropower project to conduct studies at the watershed level in order to address cumulative impacts and to design the most effective and comprehensive environmental improvements and restoration actions.
- WDFW and Ecology will use the license proceedings to recommend or require implementation of environmental improvements and mitigations to achieve properly functioning populations and properly functioning habitat conditions.
- Ecology will coordinate conditions for 401 water quality certifications, pursuant to Section 401 of the federal Clean Water Act, among federal and state agencies. Necessary conditions will be imposed by Ecology on hydroelectric projects via issuance of the certification, to sustain the designated use of a water body (e.g. salmonid migration, rearing, spawning and harvesting). Ecology and WDFW will require conditioning of new hydropower licenses and amended licenses with instream flow releases that "mimic" natural patterns to assist and enable the restoration of troubled fish stocks. In addition, the agencies will recommend that FERC re-licensing approval be based on an evaluation of the success of future operations in mimicking the natural hydrograph for the watersheds.
- WDFW will recommend to the Department of Interior (acting through USFWS) and the Department of Commerce (acting through NMFS) fish and wildlife protection measures such as passage, when these agencies prescribe up-stream and downstream fish passage measures at a hydroelectric project. These prescriptions are mandatory. FERC is required to give these recommendations due consideration and must adopt them unless FERC finds them inconsistent with the Federal Power Act.

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- Ecology will file objection with FERC to a project that negatively affects coastal resources under the state's federally approved Coastal Zone Management Program pursuant to the federal Coastal Zone Management Act. For projects within the CZMP boundaries, the state also may require the applicant to comply with state shoreline permitting laws. While the Coastal Zone Management Act allows the state to either object or concur that a project is consistent with the CZMP, it does not afford the state ability to condition a project
- Resource agencies will require that project applicants monitor the outcome of hydropower restoration efforts. Adaptive management will be one of the basic required conditions of relicensing.
- Resource agencies will have project applicants fund other enhancement efforts as part of an overall mitigation package. This may include the establishment of land and water trust funds to mitigate unavoidable impacts of hydropower operations (e.g. Mid-Columbia PUD agreement).
- Resource agencies will encourage licensees to implement interim mitigation measures during prolonged re-licensing proceedings.
- The state supports detailed studies to evaluate the biologic, economic, and societal impacts of breaching, decommissioning, and/or removing large dams in areas where preliminary investigations show the dams are significant contributors to the limiting factors for salmon recovery and mitigation is unable to address the problems. Studying dam removal does not, however, ultimately mean that the dam is removed or breached. Where appropriate for salmon recovery, the state will recommend that FERC uses its authority to decommission a project (e.g. removal of the dam at Condit on the White Salmon River) during the re-licensing process.
- WDFW and Ecology will closely monitor implementation of mitigation measures required as a condition in the license issued by FERC. The state will also work to ensure that new licenses include provisions for monitoring and the need to adjust operation practices if necessary without going through a license re-opener process described below.

State Actions on Hydropower Projects not Due for Re-licensing

For projects not subject to re-licensing for a number of years, there is no clear process to bring about changes in project operation. In 1994, FERC adopted a policy to use reserved authority in licenses for hydropower to ameliorate cumulative impacts of such projects in the same river basin as a project under a re-licensing process. This policy anticipates that if FERC issues a license for a project which resides in the same basin as other projects, FERC will reserve authority to reopen the license of that same project if needed to address cumulative effects in relation to other projects at a later date. FERC historically has not been supportive of license conditions that create operational uncertainty.

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FERC's policy statement stipulates that the Commission will "define that reserved authority as narrowly and with as much specificity as possible." Thus, while FERC's support for this policy may appear to be lukewarm, it nonetheless may prove critical to any regional or watershed response for salmon recovery in basins with more than one hydropower project and where impacts of hydropower cannot accurately be assessed and mitigated project by project.

In other cases where an isolated project license contains an explicit re-opener clause, FERC may be reluctant to reopen the license, particularly if the licensee objects. This is because the Federal Power Act seems to suggest that licenses may only be altered upon mutual agreement between the licensee and the Commission.

State actions for hydropower projects not due for re-licensing, in areas with existing and proposed ESA listings are the following:

- WDFW and Ecology in cooperation with other agencies will identify the dams, which have significant impacts on anadromous fish populations and the specific problems at those dams, such as blocked passage or low flows. Specific mitigation and restoration actions will then be identified to address the impacts at each dam, based on the severity of harm to anadromous fish (see section on state actions during re-licensing). The information, when available, will be provided to the regional and watershed recovery groups to use in the limiting factors analysis.
- Resource agencies will seek FERC support on using the re-opener clause to start mitigating the impacts of the dams on anadromous fish now, not 5 to 10 years in the future.
- Resource agencies will work with dam owners to seek voluntary implementation of mitigation and restoration measures and amend FERC license, if needed.
- If voluntary efforts fail, the resource agencies will petition FERC to reopen the license.
- Under limited circumstances [Section 401(a)(3)] Ecology may revoke the existing 401 certificate, which could then impact the validity of the license.

IV. Monitoring and Adaptive Management: *Are we making progress?*

The Departments of Fish and Wildlife and Ecology and other agencies will develop a monitoring protocol to closely monitor implementation of mitigation measures required as a condition in the license issued by FERC. The state will also work to ensure that new licenses include provisions for monitoring and the need to adjust operation practices if necessary. The monitoring program will include the following elements:

1. *Implementation:*

- Review the state efforts to recommend fish protection measures during re-licensing.
- Review completed FERC licensing for sufficient protection measures for fish.
- Review state's performance in petitioning for immediate actions, license re-openers and other needed actions to start addressing salmon recovery now.
- Review if re-licensing is occurring at a sufficient pace.
- Quantify goals for increased spawning upstream of dam, water quality improvements, and fish passage improvements.

2. *Effectiveness:*

- Is fish utilization of previously inaccessible spawning and rearing habitat above dams increasing?
- Are downstream effects on water quality improving?
- Is upstream/downstream passage having low enough effects to sustain fisheries on wild stocks?
- Are mitigation activities for unavoidable impacts resulting in "no net impacts"?

COLUMBIA RIVER BASIN HYDROPOWER SYSTEM

Note: This is a description of various processes in place to develop plans for restoration of fish and wildlife resources in the Columbia River Basin. While the focus of this chapter is on hydropower, the discussion of the Columbia River Basin is broader.

The issues for the Columbia-Snake River Basin Hydropower system revolve, in large part, around federally developed and coordinated hydropower and irrigation facilities on a multi-state, international river system. Primarily through NMFS, the Bonneville Power Administration, USCE, USBR and FERC the federal government is ultimately responsible for mitigating the hydropower system impacts on listed stocks.

The state of Washington—through the Northwest Power Planning Council and in consultation with NMFS—influences the development of formal strategies to be implemented and funded by the federal government. Following is a summary of some of the issues and processes guiding recovery strategies and actions to address the impacts of the hydropower system and the dams on the Columbia and the Snake.

A. Summary of Key Governance Structures and Strategies

1. The Northwest Power Planning Council's Columbia Basin Fish and Wildlife Program

The Northwest Power Act of 1980 created the Northwest Power Planning Council, an interstate compact among Idaho, Oregon, Montana and Washington composed of eight members, two appointed by each of the governors of the four states. Its intent is to bring regional influence to what historically had been federally driven activities in the Columbia River Basin.

Every five years the Council develops a fish and wildlife program to “protect, mitigate and enhance fish and wildlife affected by the development, operation and management of hydropower facilities while assuring the Pacific Northwest an adequate, efficient, economical and reliable power supply.” This program is based in large part on the recommendations of the region's Indian tribes and the four states' fish and wildlife agencies. The program is intended to serve as the blueprint for BPA's expenditures and activities by the other federal agencies such as the Army Corps of Engineers and the Bureau of Reclamation.

- The Multi-Species Framework

The Northwest Power Planning Council initiated the Multi-Species Framework Project in response to two scientific reviews. Both reviews suggested the region's fish and wildlife program would benefit from a science-based multi-species framework that would help guide policy choices.

The scientific groups also suggested the Council should develop a science-based vision for Columbia Basin fish and wildlife management that recognizes the interrelated parts of the Basin's ecosystem. As a result the Framework is developing a set of alternatives for

future management of the Basin and will analyze the biological, social and economic effects of the alternatives.

States, tribes, federal agencies, Council staff and stakeholders are participating in the development and analysis of the alternatives. Regional input and comments are being solicited on the alternatives and analysis through the summer. A draft report will be available for public review in September 1999.

The state governments, tribal governments, federal agencies and the Council expect the Framework to guide the development of, among other things, alternatives hydropower system actions and alternatives tributary habitat and hatchery approaches, by providing information on the likely biological, social and economic outcomes of those alternatives.

The National Marine Fisheries Service recently completed an analysis of ecological effects likely to result from the alternatives, relying on the PATH process.

Federal, state and tribal agencies will develop implementation plans for the alternative selected. For example, federal agencies with specific responsibilities under the Endangered Species Act, Indian treaties, and other authorities will produce a detailed management plan for the federal hydropower system before the end of 1999.

The Council expects to begin Fish and Wildlife Program amendment process sometime in late 1999

2. Columbia River Basin Forum

The NMFS 1999 decision on river system configuration – and its impact on the BPA rate case – has prompted increased attention to the larger issue of the role of the states, the federal government and the tribes in making river-use decisions that affect fish and wildlife recovery strategies and the future of users and industries dependent on the Columbia.

Currently, authority over river-use is diffused among federal, state/local and tribal governments that are carrying out the differing mandates of various laws and treaties. The diffusion of purpose, the potential for conflicts, and the lack of coordination among these laws and governments have led many to wonder whether a different governance structure could lead to improved decisions and actions on the river. The governors of the four Northwest states have worked with tribes, representatives of the federal government and stakeholders on alternative governance options.

The *Columbia River Basin Forum*, formerly known as the three sovereigns, was selected as the option by the governors, tribes, and federal agencies. The Forum is made up of the region's four governors, 11 of the 13 Columbia Basin tribes and the federal agencies involved in the Columbia River. Its purpose is to provide a forum to collaborate on and coordinate basin level policy, planning and implementation issues and processes that effect the Columbia River Basin's fish and wildlife and related habitat. The Forum

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would have no decision-making authority; but can make consensus-recommendations to decision-making bodies.

The Forum provides a place for regional governments, interested parties and the general public to utilize information and analysis developed through the Framework, by the federal caucus and through the development of the Northwest Power Planning Council's Fish and Wildlife Program to discuss alternative management approaches to the Basin and test regional agreement on the various alternatives.

The federal agencies, for example, expect to discuss their Biological Assessment on hydropower operations and a package of actions in the other Hs (harvest, habitat, and hatcheries) within the Forum. The states, tribes, and the Council have the opportunity to do the same, bringing any particular management or recovery plans forward for discussion. Other regional interests will also be invited to participate in the Forum discussions.

The overall goal of the Forum is to develop a regionally agreed upon recommendation for fish and wildlife recovery that addresses all factors affecting fish and wildlife and other related basin wide resources. The Forum will serve as a policy discussion arena to inform the statutorily mandated and ongoing federal processes and the Northwest Power Planning Council's Fish and Wildlife Program amendment process.

3. Federal Agencies

The 1991 listing of Snake River sockeye, spring/summer and fall chinook on the endangered species list has changed much of the historically decision-making process in the Columbia River Basin. Nine federal agencies are involved in the management of the Columbia River. Several of the agencies will be involved in ESA consultations-required to prepare a biological assessment and biological opinions.

The Endangered Species Act, through the National Marine Fisheries Service, holds the trump card for all decisions affecting endangered fish. If there is a conflict between the regional plan and the needs of ESA-listed fish, the latter has legal priority and spending by BPA and other federal agencies must reflect this priority. In spring of 1995, the National Marine Fisheries Service issued a "Biological Opinion," an interim guide for the operations of the hydroelectric dams to minimize the hydropower system's impact on endangered Snake River fish. The Army Corps of Engineers, the Bureau of Reclamation and the operators of the other mainstem Snake and Columbia dams must operate the dams as directed by the NMFS "Bi-Op"

The U.S. Corps of Engineers is conducting a feasibility study on alternative actions for the lower Snake River dams. The Corps' Environmental Impact Statement (EIS) examines a number of alternatives that are somewhat different from those being considered in the Framework because the Corps' process examines just hydropower actions on the Snake River. The Corps intend to release a draft of the EIS for public comment this fall.

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NMFS is required to issue a final recommendation for the long-term configuration of the hydropower system in December of 1999. This recommendation is frequently referred to as the "99 Decision." Included in the recommendations will be the NMFS's official position on whether the four Army Corps of Engineers dams on the lower Snake River should be breached to aid fish migration and habitat or whether other strategies (such as barging juvenile fish around the dams) will be employed, thus preserving the dams as suppliers of electricity and navigation access to inland ports. As part of the "99 Decision" process, there are ongoing studies of the economic, social, and cultural effects of dam-breaching, as well as scientific studies of the effects of dam-breaching on the survival of fish.

- Bonneville Power Administration

The Bonneville Power Administration manages the river by coordinating operations of the federal and nonfederal dams of the Columbia-Snake system. BPA sells the electricity generated at the Army Corps and Bureau dams via five-year contracts with utilities and a few large industrial customers. The revenues generated from these sales exceed \$2 billion and are used to pay variety of costs, such as payments to the U.S. Treasury on the \$10 billion debt on the construction and maintenance of the dams, \$7 billion debt on the region's failed nuclear power program, energy conservation programs and, of course, the bulk of fish and wildlife programs throughout the Columbia Basin.

Most of BPA's power sales contracts expire in 2001. BPA is seeking to renew contracts with its customers for the 2001-2006 time period using processes called a "rate case" and a "subscription period. The rate case will determine prices for power to be sold to different sectors (public utilities, private utilities, and selected large industries), and the subscription period will allow these wholesale customers to sign up for contracts.

In determining the price it will charge, BPA must make certain assumptions on how much revenue it will spend directly for fish programs and how much revenue will be forgone because of the need to spill water over the dams (not through the turbines) for the sake of the fish. How much BPA spends -- and how it spends it -- is dictated by formal U.S government treaties with Indian tribes and Canada and at least two federal laws, the Endangered Species Act and the Northwest Power Act. At the same time, the price BPA can charge its customers is limited, in a practical sense, by the projected market rates for power during the subscription period.

For the most part, BPA's annual fish and wildlife expenditures are spent to implement the Council's program. The federal, state and tribal fish and wildlife managers rank and prioritize annual project proposals which are then analyzed by a panel of independent scientists for their scientific merit and relevance to the Council's program. The scientists forward their report to the Council which then decides which projects it will recommend that BPA fund with electricity ratepayer dollars.

In anticipation of its rate case, BPA has announced a set of principles and management tools designed to meet its fish obligations, which will be the subject of further scrutiny and deliberation in the rate case.

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4. Columbia Basin Indian Tribes

Thirteen federally recognized Indian tribes are active and effective participants in Columbia-Snake basin decision-making. Individually and through membership organizations such as the Columbia River Inter-Tribal Fish Commission and the Columbia Basin Fish and Wildlife Authority, they continue to provide management and policy direction at both the watershed level and in the ongoing debates over hydroelectric system operations and configuration.

As sovereign governments, the tribes and the state exercise cooperative management authority and responsibilities over fish and wildlife. Through treaties and executive orders, the tribes secured and reserved federally protected rights to hunt and fish. They are interested in restoration of stocks sufficient to meet their reserved rights to fish at all usual and accustomed places for quantities of fish that meet their cultural and nutritional needs as well. Neither the Northwest Power Act nor the Endangered Species Act fully accounts for the federal government's trust and treaty obligations to the basin's tribes.

To ensure coordination and effective representation in the Framework, the Forum and the Council's planning efforts, the Tribes have formed a Tribal Caucus. The Tribal Caucus serves to identify consensus views among the participating Tribes.

The Federal and Tribal Caucuses and the Northwest Power Planning Council will provide mechanisms for communication between the states, tribes and federal agencies.

5. Mid-Columbia Public Utility Districts

As stated earlier the three mid-Columbia Public Utility Districts -- Chelan County PUD, Douglas County PUD, and Grant County PUD-- own and operate five dams on the mainstem Columbia. The 100+ miles of river that the Mid-Columbia dams influence are some of the most fragile and valuable in the system. Steelhead, chinook, coho and sockeye all traverse the Mid-Columbia stretch.

The pending FERC re-licensing of the five dams has prompted detailed assessments of the impact the dams have on adult and juvenile salmon. The Washington Department of Fish and Wildlife, the Department of Ecology, the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service have worked with the biologists, managers and commissioners of the three PUDs to develop the mid-Columbia Habitat Conservation Plan (HCP) described above.

Details of Grant County PUD's participation in the HCP are still being discussed, but Douglas PUD and Chelan PUD have agreed to ensure that their dams' operations, hatchery work and habitat rehabilitation result in *No Net Impact* of fish.

Grant County PUD has invested a great deal on surface collection and by-pass facilities at Wanapum and Priest Rapids dams but the failure of the systems to meet requirements for reductions in fish mortality has complicated Grant's participation in the Mid-Columbia

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HCP. Negotiations with Grant on the hydropower, habitat and hatchery components of an HCP continue.

B. Other Issues

1. Hanford Reach

The Hanford Reach of the Columbia River is the 51-mile, undammed, free-flowing stretch of the mainstem that flows through the Hanford Nuclear Reservation between Grant County's Priest Rapids Dam and McNary Dam near the Tri-Cities. The U.S. Department of Energy has controlled most of the land adjacent to the river, preventing development and in many cases, human access to that land. As a consequence, the government preserved an ecological sanctuary along and within the river that has resulted, in part, in the healthiest, self-sustaining population of Chinook salmon anywhere in the Columbia River Basin. The Hanford Reach fall Chinook are an important component of the U.S. and Canadian commercial fishery in the Pacific and provide the bulk of fish harvested by tribal and recreational fishers in the Columbia.

Grant County PUD, along with the other dam operators and BPA, are signatories of the *Vernita Bar Agreement* which provides for stable flows during the chinook spawning season. The result has been a significant increase in successful spawning. However, unstable flows during the spring, when newly hatched juvenile fall Chinook are still in the river, has killed thousands of fish by stranding them in near-shore habitats. Spring, 1998, Grant County PUD took action to minimize stranding and is working with federal, state, tribes and other entities to develop a long term solution.

2. Transportation v. In-river Migration

Juvenile salmon and steelhead migrating out of the Snake and mid-Columbia Rivers reach the estuary below Bonneville Dam in one of three ways: 1) they are collected at some of the dams and placed in barges headed downstream where they are released into the estuary; 2) they are collected and put in trucks that drive them on surface roads to the estuary; or 3) they are allowed to remain in the river, to be flushed through the system via spill at some of the dams. Each of these strategies involves risks to individual fish and to sub-species. The relative impact of these strategies on fish survival is the subject of scientific studies.

The process for analyzing technical hypothesis (PATH) is a group of scientists contracted by NMFS and NPPC to model various juvenile migration scenarios -- from transportation of every collectable juveniles, to no transportation, to breaching the four Lower Snake dams. This scientific work will help inform the NMFS 1999 decision on configuration of the federal Columbia River power system.

According the Northwest Power Planning Council's Independent Scientific Advisory Board (ISAB) the reliance on any one strategy runs the risk of inadvertently selecting certain species with certain life histories and habits. This could be detrimental to life-cycle diversity critical to the ability of salmon and steelhead populations to withstand a variety of environmental conditions.

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The ISAB did note that transportation of juveniles in trucks poses great risks to the individuals -- and therefore the species -- being trucked and that this strategy should be stopped. WDFW and the Northwest Power Planning Council are working with NMFS and the federal dam operators to investigate the best alternative strategy for the species that are typically trucked late in the migration season.

There are risks to fish that travel in the river, too. Predation by birds and fish, high temperatures, turbines and even water spilled at the dams to keep them out of the turbines have, when taken together, profound impacts on the fish migrating downstream.

3. Dissolved Gas

Spilling water past, not through, turbines at the dams is a measure called for by the NMFS 1995 biological opinion and supported by the WDFW. But spilling large volumes of water causes the river below the dams to become saturated with dissolved nitrogen, a cause of gas bubble disease (GBD) in juvenile fish that manifests itself in ways similar to the bends in scuba divers. It is believed that in some circumstances GBD is significant enough to kill -- directly or indirectly -- significant numbers of juveniles that spill is intended to aid.

The saturation of water with nitrogen often exceeds state water quality standards. Washington will continue to work with the relevant authorities to reduce the amount of gas saturated water entering Grand Coulee from Canadian reservoirs and improving the performance of Washington dams through installation of devices that limit the amount of nitrogen gas absorbed by the river.