

# APPENDIX

The Appendix, which follows in this volume, is legally part of the fish and wildlife program. The provisions of this Appendix have been formally adopted by the Council and changes to this Appendix require formal amendment of the fish and wildlife program.

## APPENDIX

The contents of the Appendix are:

- A. Glossary
- B. Hydroelectric Development Conditions: This section was previously Section 12 (“Future Hydroelectric Development”) of the 1994-1995 Fish and Wildlife Program. This chapter contains conditions to protect fish and wildlife that are applicable to FERC-licensed projects and also designates certain areas as Protected Areas, in which the Council recommends there be no new hydroelectric projects developed.
- C. Wildlife Provisions: These provisions were previously part of Section 11 (“Wildlife”) of the 1994-1995 Fish and Wildlife Program, including Section 11.2E (“Mitigation Priorities”), Section 11.5A (“Mitigation Considerations in Dam Licensing”) and Table 11.4 (“Estimated Losses Due to Hydro-power Construction”).
- D. Provisional Statement of Biological Objectives for environmental characteristics at the Basin level.
- E. Findings on the Recommendations Submitted to the Council in 2000 for Amendments to the Fish and Wildlife Program (the findings are not contained in this volume. They are posted on

the Council’s website at <http://www.nwcouncil.org> and will be available on the same CD-ROM with the Technical Appendix).



# TECHNICAL APPENDIX

The Technical Appendix, which is published separately, contains reference materials which provide further information and assistance in implementing this program. In most instances, these materials amplify the provisions of the program with information at a greater level of detail than the main text of the program. The materials in the Technical Appendix have been approved by the Council for inclusion in the Technical Appendix, but have not been formally adopted as part of this program and may be changed without amending the program itself.

To conserve paper, the full Technical Appendix to this program is not attached, but is posted on the Council's website at <http://www.nwppc.org>.

The Council also intends to make the Technical Appendix available on a CD-ROM.

## TECHNICAL APPENDIX

The contents of the Technical Appendix may be modified from time to time, but currently include:

- A. The Scientific Foundation. This document is a more detailed discussion of the information underlying the scientific principles and ecological provinces in the program.
- B. Artificial Production Review Report (text from the APR including policies and purposes for artificial production).
- C. Project management and implementation guidelines, including the subbasin assessment template, the subbasin plan template, three step review procedures and implementation of statutory requirements regarding cost-effectiveness and consideration of ocean conditions.
- D. Review of the U.S. Army Corps of Engineers Capital Construction Program, a report of the Independent Scientific Advisory Board (1998).
- E. Schedule of dates for reports requested under this program. (To be approved by the Council following consultation with the affected parties.)
- F. Estimates of hydropower-related losses, consisting of Appendix D "Compilation of Information on Salmon and Steelhead Losses in the Columbia River Basin" and Appendix E "Numerical Estimates of Hydropower-Related Losses" from the 1987 Fish and Wildlife Program.

The Technical Appendix may be expanded as appropriate to include other documents that will be valuable as references in implementing the Council's program.

The definitions in this list are provided for clarification of terms used throughout this program.

### A

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**Act** — See Northwest Power Act.

#### **adaptive management**

A scientific policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as vehicles for learning. Projects are designed and implemented as experiments so that even if they fail, they provide useful information for future actions. Monitoring and evaluation are emphasized so that the interaction of different elements of the system are better understood.

#### **anadromous fish**

Fish that hatch in freshwater, migrate to the ocean, mature there and return to freshwater to spawn. For example, salmon or steelhead.

#### **applicable federal laws**

The Endangered Species Act and the Clean Water Act.

### B

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#### **biological diversity**

The variety of, and variability among, living organisms and the ecological complexes in which they occur. Biological diversity at its most basic level is the genetic diversity (genetic variation found within each species), phenotypic and morphological diversity (physical, life history and behavioral variation found within each species), species diversity (number of species in a given ecosystem), and community/ecosystem diversity (variety of habitat types and ecosystem

processes extending over a region).

#### **biological performance**

The responses of populations to habitat conditions, described in terms of capacity, abundance, productivity, and life history diversity.

#### **biological potential**

The biological potential of a species means the potential capacity, productivity and life history diversity of a population in its habitat at each life stage.

#### **blocked areas**

Areas in the Columbia River Basin where hydroelectric projects have created permanent barriers to anadromous fish runs. These include the areas above Chief Joseph and Grand Coulee dams, the Hells Canyon Complex and other smaller locations.

#### **Bonneville Power Administration (Bonneville)**

The sole federal power marketing agency in the Northwest and the region's major wholesaler of electricity. Created by Congress in 1937, Bonneville sells power to public and private utilities, direct service customers, and various public agencies in the states of Washington, Oregon, Idaho, Montana west of the Continental Divide, (and parts of Montana east of the Divide) and smaller adjacent areas of California, Nevada, Utah and Wyoming. The Northwest Power Act charges Bonneville with additional duties related to energy conservation, resource acquisition, and fish and wildlife.

#### **Bureau of Reclamation, U.S. Department of the Interior**

An agency that administers some parts of the federal program for water resource development and use in western states. The Bureau of Reclamation owns and operates a number

of dams in the Columbia River Basin, including Grand Coulee and several projects on the Yakima River.

#### **bypass system**

A channel or conduit in a dam that provides a route for fish to move through or around the dam without going through the turbine units.

### C

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#### **captive broodstock**

Fish raised and spawned in captivity.

#### **carrying capacity**

The number of individuals of one species that the resources of a habitat can support.

#### **Columbia River Compact**

An interstate compact between the states of Oregon and Washington by which the states jointly regulate fish in the Columbia River.

#### **Columbia River System**

The Columbia River and its tributaries.

#### **Columbia River Treaty**

The treaty between the United States and Canada for the joint development of the Columbia River. It became effective on September 16, 1964.

#### **Corps of Engineers, U.S. Department of the Army (Corps)**

An agency with the responsibility for design, construction and operation of civil works, including multipurpose dams and navigation projects.

#### **cost-effective**

Where equally effective alternative means of achieving the same sound biological objective exist, the

alternative with the minimum economic cost is considered the most cost-effective measure.

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## D

### **dissolved gas**

The amount of chemicals normally occurring as gases, such as nitrogen and oxygen, that are held in solution in water, expressed in units such as milligrams of the gas per liter of liquid. Supersaturation occurs when these solutions exceed the saturation level of the water (beyond 100 percent).

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## E

### **ecosystem**

The biological community considered together with the land and water that make up its environment.

### **environmental characteristics**

The environmental conditions or changes sought to achieve the desired changes in population characteristics.

### **escapement**

The number of salmon and steelhead that return to a specified point of measurement after all natural mortality and harvest have occurred. Spawning escapement consists of those fish that survive to spawn.

### **estuary**

The part of the wide lower course of a river where its current is met and influenced by the tides.

### **extinction**

The natural or human-induced process by which a species, subspecies or population ceases to exist.

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## F

### **Federal Energy Regulatory Commission (FERC)**

The Commission issues and reg-

ulates licenses for construction and operation of non-federal hydroelectric projects and advises federal agencies on the merits of proposed federal multipurpose water development projects.

### **fish and wildlife agencies**

This category includes the Fish and Wildlife Service, U.S. Department of the Interior; the Idaho Department of Fish and Game; the Montana Department of Fish, Wildlife and Parks; the National Marine Fisheries Service, U.S. Department of Commerce; the Oregon Department of Fish and Wildlife; and the Washington Department of Fish and Wildlife.

### **Fish Passage Center**

The center established under section III (D)(6) of the program.

### **flows**

The rate at which water passes a given point in a stream or river, usually expressed in cubic-feet per second (cfs).

### **flow augmentation**

Increased flow from release of water from storage dams.

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## H

### **habitat**

The locality or external environment in which a plant or animal normally lives and grows. As used in this program, habitat includes the ecological functions of the habitat structure.

### **harvest management**

The process of setting regulations for the commercial, recreational and tribal fish harvest to achieve a specified goal within the fishery.

### **hydroelectric power or hydropower**

The generation of electricity using falling water to turn turbo-electric generators.

### **hydrosystem**

The hydroelectric dams on the Columbia River and its tributaries.

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## I

### **Implementation Team**

A policy-level working group established by the National Marine Fisheries Service to provide advice on the implementation of the biological opinion on the effects of the federal dams in the Columbia River basin. The IT oversees the Technical Management Team, which deals with hydrosystem operations, and the System Configuration Team, which deals with structural changes at the dams to improve fish passage.

### **impoundment**

A body of water formed behind a dam.

### **irrigation screens**

Screens using wire mesh placed at the point where water is diverted from a stream or river. The screens keep fish from entering the diversion channel or pipe.

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## J

### **juvenile**

Fish from approximately one year of age until sexual maturity.

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## M

### **mainstem**

The main channel of the river in a river basin, as opposed to the streams and smaller rivers that feed into it. In the fish and wildlife program, main-

stem refers to entirety of the Columbia and Snake rivers.

### **mainstem passage**

The movement of salmon and steelhead around or through the dams and reservoirs in the Columbia and Snake rivers.

### **mainstem survival**

The proportion of anadromous fish that survive passage through the dams and reservoirs while migrating in the Columbia and Snake rivers.

### **metadata**

Data exist in two forms — primary data and metadata. Primary data are numbers or counts — for example, the number of adult fish counted in a given time period, interval and location. Metadata describe how those numbers were obtained, including the monitoring design (selection of times and locations), objectives, and methods.

### **mixed-stock fishery**

A harvest management technique by which different species, strains, races or stocks are harvested together.

## **N**

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### **natural production**

Spawning, incubating, hatching and rearing fish in rivers, lakes and streams without human intervention.

### **naturally spawning populations**

Populations of fish that have completed their entire life cycle in the natural environment and may be the progeny of wild, hatchery or mixed parentage.

### **Northwest Power Act**

The Pacific Northwest Electric Power Planning and Conservation Act (16 U.S.C. 839 et seq.), which authorized the creation of the Northwest Power Planning Council. The act directs the Council to develop

this program to protect, mitigate and enhance fish and wildlife, including related spawning grounds and habitat on the Columbia River and its tributaries, to establish an Independent Scientific Review Panel to review projects implementing this program that are proposed for funding by Bonneville, and to make final recommendations to Bonneville on implementation projects.

## **O**

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### **off-site mitigation**

The improvement in conditions for fish or wildlife species away from the site of a hydroelectric project that had detrimental effects on fish and/or wildlife, as part or total compensation for those effects. An example of off-site mitigation is the fish passage restoration work being conducted in the Yakima River Basin for the detrimental effects caused by mainstem hydroelectric projects.

### **operational losses**

The direct wildlife losses caused by the day-to-day fluctuations in flows and reservoir levels resulting from the operation of the hydrosystem.

## **P**

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### **passage**

The movement of migratory fish through, around, or over dams, reservoirs and other obstructions in a stream or river.

### **PIT tags**

Passive Integrated Transponder tags are used for identifying individual salmon for monitoring and research purposes. This miniaturized tag consists of an integrated microchip that is programmed to identify individual fish. The tag is inserted into the body cavity of the fish and decoded at selected monitoring sites.

## **plume**

The area of the Pacific Ocean that is influenced by discharge from the Columbia River, up to 500 miles beyond the mouth of the river.

### **population**

A group of organisms belonging to the same species that occupy a well-defined locality and exhibit reproductive continuity from generation to generation.

### **powerhouse**

A primary part of a hydroelectric dam where the turbines and generators are housed and where power is produced by falling water rotating turbine blades.

## **R**

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### **rearing**

The juvenile life stage of anadromous fish spent in freshwater rivers, lakes and streams before they migrate to the ocean.

### **reservoir**

A body of water collected and stored in an artificial lake behind a dam.

### **resident fish**

Fish that spend their entire life cycle in freshwater. For program purposes, resident fish includes landlocked anadromous fish (e.g., white sturgeon, kokanee and coho), as well as traditionally defined resident fish species.

### **resident fish substitutions**

The enhancement of resident fish to address losses of salmon and steelhead in those areas permanently blocked to anadromous (ocean-migrating) fish as a result of hydroelectric dams.

## **riparian habitat**

Habitat along the banks of streams, lakes or rivers.

## **run**

A population of fish of the same species consisting of one or more stocks migrating at a distinct time.

## **S**

### **salmonid**

A fish of the Salmonidae family, which includes soft-finned fish such as salmon, trout and whitefish.

### **smolt**

A juvenile salmon or steelhead migrating to the ocean and undergoing physiological changes (smoltification) to adapt its body from a freshwater to a saltwater existence.

### **spawn**

The act of fish releasing and fertilizing eggs.

### **species**

A group of individuals of common ancestry that closely resemble each other structurally and physiologically and that can interbreed, producing fertile offspring.

### **spill**

Releasing water through the spillway rather than through the turbine units.

### **spillway**

The channel or passageway around or over a dam through which excess water is released or “spilled” past the dam without going through the turbines. A spillway is a safety valve for a dam and, as such, must be capable of discharging major floods without damaging the dam, while maintaining the reservoir level below some predetermined maximum level.

## **stock**

A population of fish spawning in a particular stream during a particular season. They generally do not interbreed with fish spawning in a different stream or at a different time.

### **subbasin**

A set of adjoining watersheds with similar ecological conditions and tributaries that ultimately connect, flowing into the same river or lake. Subbasins contain major tributaries to the Columbia and Snake rivers.

### **supplementation**

The release of hatchery fry and juvenile fish in the natural environment to quickly increase or establish naturally spawning fish populations.

### **subbasin planning**

A coordinated systemwide approach to planning in which each subbasin in the Columbia system will be evaluated for its potential to produce fish in order to contribute to the goal of the overall system. The planning will emphasize the integration of fish and wildlife habitat, fish passage, harvest management and production.

## **T**

### **target population**

A species or population singled out for attention because of its harvest significance or cultural value, or because it represents a significant group of ecological functions in a particular habitat type.

### **terminal fishery**

A fishery designed to increase harvest of abundant fish stocks and minimize effects on depleted stocks by focusing the fishery on locations where the abundant stocks are produced — in net pens, for example — and where the fish also return to spawn.

## **Technical Management Team**

A technical working group established by the National Marine Fisheries Service to provide advice on how to operate the federal dams in the Columbia River Basin in a manner that minimizes fish and wildlife impacts. The TMT deals with issues such as reservoir storage levels, flow augmentation, and spill.

### **transboundary**

Refers to U.S. and Canadian border..

### **transportation**

Collecting migrating juvenile fish and transporting them around the dams using barges or trucks.

### **tribes**

In this program, these include the Burns-Paiute Tribe; the Coeur d’Alene Tribes; the Confederated Tribes of the Colville Reservation; the Confederated Salish-Kootenai Tribes of the Flathead Reservation; the Confederated Tribes of the Umatilla Reservation of Oregon; the Confederated Tribes of the Warm Springs Reservation of Oregon; the Confederated Tribes and Bands of the Yakama Nation; the Kalispel Tribe of Indians; the Kootenai Tribe of Idaho; the Nez Perce Tribe of Idaho; the Shoshone-Paiutes of the Duck Valley Reservation; the Shoshone-Bannock Tribes of the Fort Hall Reservation; and the Spokane Tribe of Indians.

## **W**

### **watershed**

The area that drains into a stream or river. A subbasin is typically composed of several watersheds.

### **weak stock**

A stock of fish where the long-term survival of the stock is in doubt. Typically this is a stock where the population is small and is barely

reproducing itself or is not reproducing itself. While ESA-listed stocks are considered weak stocks, the term also includes other populations that would not yet qualify for ESA listing.

**wild populations**

Fish that have maintained successful natural reproduction with little or no supplementation from hatcheries.

**FUTURE HYDROELECTRIC DEVELOPMENT**

Much of this program has focused on mitigating damage done to Columbia River Basin fish and wildlife by hydropower development and operations in the past. But the future is equally important. The Corps of Engineers and the Bureau of Reclamation continue to study the need for additional federal hydroelectric projects and to plan for new development in the basin. The Federal Energy Regulatory Commission has many permits and applications pending for hydroelectric development in Idaho, Oregon, Montana and Washington. Many of those applications and permits are for projects throughout the Columbia River Basin. Dozens of small or medium-sized hydroelectric projects are proposed for tributary drainage basins that contain important anadromous fish habitat. However, most new hydroelectric development will be accomplished by private or non-federal public entities licensed by the Federal Energy Regulatory Commission.

Many of the proposals are for hydroelectric projects that would produce less than 5 megawatts of electricity. Although individual small projects may have no significant adverse effects on the fish and wildlife resources of the basin, the cumulative effects of such development throughout a river basin could be quite harmful. These cumulative effects need to be taken into account fully.

The Council estimates that 4,600 stream miles of Columbia River Basin salmon and steelhead spawning and rearing habitat have been lost to development, not including losses of migration routes and of resident fish and wildlife habitat. Minimizing further habitat loss is especially important in view of the Council's goal of doubling salmon and steelhead runs in the Columbia

River Basin consistent with system policies (see Sections 2 and 4). Development in critical fish and wildlife areas leads to divisive and expensive conflicts that the Council believes can be avoided through resource planning.

The Council finds that future hydroelectric developers in the basin should be required to mitigate harm to fish and wildlife and has adopted program measures calling for such mitigation. New hydroelectric development has the potential to cause further damage to the basin's fish and wildlife resources as well as to negate ongoing Council efforts to remedy damage caused by the existing hydropower system. Federal agencies also should assess and mitigate the cumulative effects on fish and wildlife of multiple hydroelectric projects.

The Council also intends to continue to review applications for Federal Energy Regulatory Commission permits and licenses and for Corps of Engineers and Bureau of Reclamation proposals for hydroelectric development. The purpose of this review is to identify program measures related to the proposed development to ensure that any new development in the basin is consistent with this fish and wildlife program and the Council's Northwest Power Plan. The Council's reviews would complement and recognize, not supplant, the role of the fish and wildlife agencies and tribes in reviewing proposals for hydroelectric projects.

**1. FUTURE HYDROELECTRIC DEVELOPMENT**

**Conditions**

**Federal Energy Regulatory Commission, Corps of Engineers, Bureau of Reclamation and Bonneville**

Do not license, exempt from license, relicense, propose, recommend, agree to acquire or wheel power from, grant billing credits for, or otherwise support any hydroelectric development in the Columbia River Basin without specifically providing for these development conditions:

- Consultation with the fish managers and the Council throughout study, design, construction and operation of the project;
- Specific plans for flows and fish facilities prior to construction;
- The best available means for aiding downstream and upstream passage of anadromous and resident fish;
- Flows and reservoir levels of sufficient quantity and quality to protect spawning, incubation, rearing and migration;
- Full compensation for unavoidable fish losses or fish habitat losses through habitat restoration or replacement, appropriate propagation, or similar measures consistent with the provisions of this program;
- Assurance that the project will not inundate the usual and accustomed, traditional or contemporary fishing places of any tribe without tribal approval;
- Assurance that the project will not degrade fish habitat or reduce numbers of fish in such a way that the exercise of treaty or executive order tribal rights will be diminished;
- Assurance that all fish protection measures are fully operational at the time the project begins operation;
- The collection of data needed to

monitor and evaluate the results of the fish protection efforts; and

- Assurance that the project will not degrade water quality beyond the point necessary to sustain sensitive fish species (as designated in consultation with the fish managers).

Do not license, relicense, exempt from license, propose, recommend, agree to acquire or wheel power from, grant billing credits for, or otherwise support any hydroelectric development in the Columbia River Basin without specifically providing for these development conditions:

- Consultation with wildlife managers and the Council throughout study, design, construction and operation of the project;
- Avoiding inundation of wildlife habitat, insofar as practical;
- Timing construction activities, insofar as practical, to reduce adverse effects on nesting and wintering grounds;
- Locating temporary access roads in areas to be inundated;
- Constructing subimpoundments and using all suitable excavated material to create islands, if appropriate, before the reservoir is filled;
- Avoiding all unnecessary or premature clearing of land before filling the reservoir;
- Providing artificial nest structures when appropriate;
- Avoiding construction, insofar as practical, within 250 meters of active raptor nests;
- Avoiding critical riparian habitat (as designated in consultation with the wildlife managers) when clearing, riprapping, dredging, disposing of spoils and wastes, constructing diver-

sions, and relocating structures and facilities;

- Replacing riparian vegetation if natural revegetation is inadequate;
- Creating subimpoundments by diking backwater slough areas, creating islands and nesting areas;
- Regulating water levels to reduce adverse effects on wildlife during critical wildlife periods (as defined in consultation with the fish and wildlife managers);
- Improving the wildlife capacity of undisturbed portions of new project areas (through such activities as managing vegetation, reducing disturbance, and supplying food, cover and water) as compensation for otherwise unmitigated harm to wildlife and wildlife habitat in other parts of the project area;
- Acquiring land or management rights, such as conservation easements, where necessary to compensate for lost wildlife habitat at the same time other project land is acquired and including the associated costs in project cost estimates;
- Funding operation and management of the acquired wildlife land for the life of the project;
- Granting management easement rights on the acquired wildlife lands to appropriate management entities;
- Collecting data needed to monitor and evaluate the results of the wildlife protection efforts;
- Assurance that the project will not inundate the usual and accustomed, traditional or contemporary hunting places of any tribe without tribal approval; and
- Assurance that the project will

not degrade wildlife habitat or reduce numbers of wildlife in such a way that the exercise of treaty or executive order tribal rights will be diminished.

Ensure that all licenses for hydroelectric projects or documents that propose, recommend or otherwise support hydroelectric development explain in detail how the provisions of this section will be accomplished or the reasons why the provisions cannot be incorporated into the project.

## 2. PROTECTED AREAS

From the inception of this program, the Council has supported the concept of protecting some streams and wildlife habitats from hydroelectric development, where the Council believes such development would have major negative impacts that could not be reversed. Beginning in 1983, the Council directed extensive studies of existing habitat and has analyzed alternative means of protection. In 1988, the Council concluded that: 1) the studies had identified fish and wildlife resources of critical importance to the region; 2) mitigation techniques cannot assure that all adverse impacts of hydroelectric development on these fish and wildlife populations will be mitigated; 3) even small hydroelectric projects may have unacceptable individual and cumulative impacts on these resources; and 4) protecting these resources and habitats from hydroelectric development is consistent with an adequate, efficient, economical, and reliable power supply. The Council, relying on these studies, designated certain river reaches in the basin as "protected areas," where the Council believes hydroelectric development would have unacceptable risks of loss to fish and wildlife species of concern, their productive capacity or their habitat.

River reaches to be protected are those reaches or portions of reaches listed on the "Protected Areas List"

adopted by the Council on August 10, 1988, and subsequently. For each river reach listed on the Protected Areas List, the fish and wildlife to be protected are those on the list. The Council will supply a copy of the Protected Areas List to any party free of charge.

### **Protect Areas From New Hydropower Development**

The following are not affected by protected areas:

- Any hydroelectric facility or its existing impoundment that as of August 10, 1988, had been licensed or exempted from licensing by the Federal Energy Regulatory Commission;
- The relicensing of such hydroelectric facility or its existing impoundment;
- Any modification of any existing hydroelectric facility or its existing impoundment; and
- Any addition of hydroelectric generation facilities to a non-hydroelectric dam or diversion structure.
- Transition projects: The Council recognizes that there exist, as of August 10, 1988, applications for hydroelectric projects that are in various stages of completion before the Federal Energy Regulatory Commission. In many cases the applicants have made substantial investments and have completed, or nearly completed, agreements with all interested parties, including state fish and wildlife agencies. The Council recognizes that the Federal Energy Regulatory Commission may be obligated to complete its processes on these applications, but expects where possible that this measure will be taken into account to the fullest extent practicable.

The Council recognizes that there may exist preliminary permits or applications for licenses or exemptions for hydroelectric projects at sites that were not previously within protected areas, but which may be included within protected areas as a result of amendments approved by the Council. An important purpose of protected areas is to encourage developers to site projects outside protected areas. The Council therefore exempts from the effect of an amendment that designates a previously unprotected area as protected, any project for which the developer had obtained a preliminary permit or filed an application for license or exemption prior to the date on which the Council entered rulemaking on the amendment. However, it is the Council's intention that the Federal Energy Regulatory Commission give full consideration to the protection of fish and wildlife resources located at these project sites and provide suitable protection and mitigation for such resources in the event that a license or exemption is approved.

- Effect on water rights and riparian areas: This measure should not be interpreted to authorize the appropriation of water by any entity or individual, affect water rights or jurisdiction over water, or alter or establish any water or water-related right. The Council does not intend this measure to alter or affect any state or federal water quality classification or standards, or alter any management plan developed pursuant to the national Forest Management Act, 16 U.S.C. 1601, et seq., or the Federal Land Policy Management Act, 43 U.S.C. 1701, et seq., except to the extent planning decisions are directly related to hydropower licensing and development. Nor should this measure be interpreted to alter, amend, repeal, interpret, modify, or conflict with any interstate

compact made by the states. If this measure is found by a court or other competent authority to conflict with any other interstate compact, this measure will terminate with respect to the area involved, without further action of the Council.

This measure applies to river reaches, or portions of river reaches, and to river banks or surrounding areas only where such areas would be directly affected by a proposed hydroelectric project. In adopting this measure, the Council has not attempted to balance all the factors that may be relevant to land management determinations.

### **Bonneville Power Administration**

Do not acquire power from hydroelectric projects located in protected areas. The Council believes that the Long-Term Intertie Access Policy's reliance on protected areas is consistent with the Council's power plan and fish and wildlife program as they apply to fish and wildlife in the Columbia River Basin. The Council continues to recommend that Bonneville adopt a similar policy with respect to protected areas outside the Columbia River Basin.

### **Federal Energy Regulatory Commission**

Under the Northwest Power Act, the Federal Energy Regulatory Commission, and all other federal agencies responsible for managing, operating, or regulating federal or non-federal hydroelectric facilities located on the Columbia River or its tributaries are required to take protected area designations into account to the fullest extent practicable at all relevant stages of decision-making processes. The Council recognizes that the Federal Energy Regulatory Commission makes licensing and exemption decisions for non-federal projects, and does not expect

that the Commission will abandon its normal processes with regard to projects located in protected areas. Rather, consistent with Section 4(h)(11) of the Northwest Power Act, the Council expects that the Federal Energy Regulatory Commission will take the Council's judgment into account, and implement that judgment in licensing and exemption decisions unless the Federal Energy Regulatory Commission's legal responsibilities require otherwise.

### **3. ADDITIONAL PROTECTIONS AND CONSISTENCY OF HYDRO-POWER DEVELOPMENT**

#### **Cumulative Effects**

##### **Federal Project Operators and Regulators**

Review simultaneously all applications or proposals for hydroelectric development in a single river drainage, through consolidated hearings, environmental impact statements or assessments, or other appropriate methods. This review shall assess cumulative environmental effects of existing and proposed hydroelectric development on fish and wildlife.

##### **Ensure Consistency With This Program**

##### **Federal Energy Regulatory Commission**

Require all applicants for licenses (including license renewals, amendments and exemptions) and preliminary permits in the Columbia River Basin to demonstrate in their applications how the proposed project would take this program into account to the fullest extent practicable.

Provide the Council with copies of all applications for licenses (includ-

ing license renewals, amendments and exemptions) and preliminary permits in the Columbia River Basin so that the Council can comment in a timely manner on the consistency of the proposed project with this fish and wildlife program. This provision is not intended to supplant review of such applications by the fish and wildlife agencies and tribes.

##### **Federal Land Managers and Federal and State Fish and Wildlife Agencies**

Incorporate pertinent elements of the fish and wildlife program in the terms and conditions they apply to projects exempted from licensing under Federal Energy Regulatory Commission exemption procedures. The Council also requests federal land managers to incorporate this program into their permit procedures related to hydroelectric development on lands they manage.

##### **Corps of Engineers, Bureau of Reclamation, and any Other Federal Agency Studying or Proposing Hydroelectric Development in the Columbia River Basin**

Provide opportunity for Council review and comment.

WILDLIFE PROVISIONS

Mitigation Priorities

**Bonneville and Wildlife Managers**

Ensure that wildlife mitigation projects implemented in fulfillment of this program are consistent with the basinwide implementation priorities described in Tables 11-1, 11-2 and 11-3, below.

*Table 11-1 Lower Columbia Subbasin Wildlife Mitigation Priorities*

Habitat Types--Target Species	Priority
<b>Riparian/Riverine</b> • Great Blue Heron	High
<b>Old Growth Forest</b> • Northern Spotted Owl	High
<b>Wetlands</b> • Great Blue Heron • Band-tailed Pigeon • Western Pond Turtle	High
<b>Coniferous Forest</b> • Ruffed Grouse • Elk • American Black Bear/Cougar	Medium

*Table 11-2 Upper Columbia Subbasin Wildlife Mitigation Priorities*

<b>Habitat Types--Target Species</b>	<b>Priority</b>
<b>Riparian/River</b> <ul style="list-style-type: none"> <li>• Bald Eagle (breeding)</li> <li>• Black-capped Chickadee</li> <li>• Peregrine Falcon</li> </ul>	High
<b>Shrub-Steppe</b> <ul style="list-style-type: none"> <li>• Sharp-tailed Grouse</li> <li>• Pygmy Rabbit</li> <li>• Sage Grouse</li> <li>• Mule Deer</li> </ul>	High
<b>Wetlands</b> <ul style="list-style-type: none"> <li>• Mallard</li> <li>• Redhead</li> </ul>	High
<b>Islands</b> <ul style="list-style-type: none"> <li>• White Pelicans</li> </ul>	Medium
<b>Agricultural Lands</b> <ul style="list-style-type: none"> <li>• Swainson's Hawk</li> <li>• Ring-necked Pheasant</li> </ul>	Low

*Table 11-3 Snake River Subbasin Wildlife Mitigation Priorities*

<b>Habitat Type--Target Species</b>	<b>Priority</b>
<b>Riparian/Riverine</b> <ul style="list-style-type: none"> <li>• Bald Eagle (breeding)</li> <li>• Bald Eagle (wintering)</li> <li>• River Otter</li> <li>• Black-capped Chickadee</li> <li>• Peregrine Falcon</li> <li>• Ruffed Grouse</li> </ul>	High
<b>Wetlands</b> <ul style="list-style-type: none"> <li>• Mallard</li> </ul>	High
<b>Native Grasslands and Shrubs</b> <ul style="list-style-type: none"> <li>• Mule Deer/Elk</li> <li>• White-tailed Deer</li> <li>• Sharp-tailed Grouse</li> </ul>	Medium
<b>Coniferous Forest</b> <ul style="list-style-type: none"> <li>• Elk</li> </ul>	Medium
<b>Old Growth Forest</b> <ul style="list-style-type: none"> <li>• Pileated Woodpecker</li> </ul>	Medium
<b>Lowland Forest</b> <ul style="list-style-type: none"> <li>• White-tailed deer</li> </ul>	Low

## MONITOR AND EVALUATE WILDLIFE EFFORTS AT NON- FEDERAL PROJECTS

Non-federal hydroelectric projects are licensed by the Federal Energy Regulatory Commission. The Electric Consumers Protection Act of 1986 (ECPA) mandates that the Federal Energy Regulatory Commission give equal consideration to the protection, mitigation of damage to, and enhancement of wildlife in licensing and relicensing decisions.

### **Mitigation Considerations in Dam Licensing Decisions**

#### **Federal Energy Regulatory Commission**

In developing license conditions, take into account to the fullest extent practicable the policies established in this section, and the measures taken by Bonneville and others to implement this section, and Section 12.1A.2 of this program. In particular, it is important to take into account the mitigation projects at federal projects undertaken pursuant to this section, to ensure that license conditions are consistent with and complement these wildlife mitigation projects and contribute fully and proportionately to regional wildlife mitigation goals.

#### **Council**

The Council will monitor the Federal Energy Regulatory Commission licensing and relicensing proceedings and comment or intervene where appropriate.

**Table 11-4 identifies the losses due to hydropower construction at federal dams in the Columbia River Basin.**

<i>Table 11-4 Estimated Losses Due to Hydropower Construction (losses are preceded by a “-”, gains by a “+”)</i>	
<b>Species</b>	<b>Total Habitat Units</b>
<b>Albeni Falls</b>	
• Mallard Duck	-5,985
• Canada Goose	-4,699
• Redhead Duck	-3,379
• Breeding Bald Eagle	-4,508
• Wintering Bald Eagle	-4,365
• Black-Capped Chickadee	-2,286
• White-tailed Deer	-1,680
• Muskrat	-1,756
• Yellow Warbler	+171
<b>Lower Snake Projects</b>	
• Downy Woodpecker	-364.9
• Song Sparrow	-287.6
• Yellow Warbler	-927.0
• California Quail	-20,508.0
• Ring-necked Pheasant	-2,646.8
• Canada Goose	-2,039.8
<b>Anderson Ranch</b>	
• Mallard	-1,048
• Mink	-1,732
• Yellow Warbler	-361
• Black Capped Chickadee	-890
• Ruffed Grouse	-919
• Blue Grouse	-1,980
• Mule Deer	-2,689
• Peregrine Falcon	-1,222 acres*
* Acres of riparian habitat lost. Does not require purchase of any lands.	
<b>Black Canyon</b>	
• Mallard	-270
• Mink	-652
• Canada Goose	-214
• Ring-necked Pheasant	-260
• Sharp-tailed Grouse	-532
• Mule Deer	-242
• Yellow Warbler	+8
• Black-capped Chickadee	+68
<b>Deadwood</b>	
• Mule Deer	-2080
• Mink	-987
• Spruce Grouse	-1411
• Yellow Warbler	-309

**Table 11-4 (cont.) Estimated Losses Due to Hydropower Construction**  
*(losses are preceded by a “-”, gains by a “+”)*

Species	Total Habitat Units
<b>Palisades</b>	
• Bald Eagle	-5,941 breeding
	-18,565 wintering
• Yellow Warbler/	-718 scrub-shrub
• Black Capped Chickadee	-1,358 forested
• Elk/Mule Deer	-2,454
• Waterfowl and Aquatic Furbearers	-5,703
• Ruffed Grouse	-2,331
• Peregrine Falcon*	-1,677 acres of forested wetland
	-832 acres of scrub-shrub wetland
	+68 acres of emergent wetland
* Acres of riparian habitat lost. Does not require purchase of any lands.	
<b>Willamette Basin Projects</b>	
• Black-tailed Deer	-17,254
• Roosevelt Elk	-15,295
• Black Bear	-4,814
• Cougar	-3,853
• Beaver	-4,477
• River Otter	-2,408
• Mink	-2,418
• Red Fox	-2,590
• Ruffed Grouse	-11,145
• California Quail	-2,986
• Ring-necked Pheasant	-1,986
• Band-tailed Pigeon	-3,487
• Western Gray Squirrel	-1,354
• Harlequin Duck	-551
• Wood Duck	-1,947
• Spotted Owl	-5,711
• Pileated Woodpecker	-8,690
• American Dipper	-954
• Yellow Warbler	-2,355
• Common Merganser	+1,042
• Greater Scaup	+820
• Waterfowl	+423
• Bald Eagle	+5,693
• Osprey	+6,159
<b>Grand Coulee</b>	
• Sage Grouse	-2,746
• Sharp-tailed Grouse	-32,723
• Ruffed Grouse	-16,502
• Mourning Dove	-9,316
• Mule Deer	-27,133
• White-tailed Deer	-21,362
• Riparian Forest	-1,632
• Riparian Shrub	-27
• Canada Goose Nest Sites	-74

**Table 11-4 (cont.) Estimated Losses Due to Hydropower Construction**  
*(losses are preceded by a “-”, gains by a “+”)*

<b>Species</b>	<b>Total Habitat Units</b>
<b>McNary</b>	
• Mallard (wintering)	+13,744
• Mallard (nesting)	-6,959
• Western Meadowlark	-3,469
• Canada Goose	-3,484
• Spotted Sandpiper	-1,363
• Yellow Warbler	-329
• Downy Woodpecker	-377
• Mink	-1,250
• California Quail	-6,314
<b>John Day</b>	
• Lesser Scaup	+14,398
• Great Blue Heron	-3,186
• Canada Goose	-8,010
• Spotted Sandpiper	-3,186
• Yellow Warbler	-1,085
• Black-capped Chickadee	-869
• Western Meadowlark	-5,059
• California Quail	-6,324
• Mallard	-7,399
• Mink	-1,437
<b>The Dalles</b>	
• Lesser Scaup	+2,068
• Great Blue Heron	-427
• Canada Goose	-439
• Spotted Sandpiper	-534
• Yellow Warbler	-170
• Black-capped Chickadee	-183
• Western Meadowlark	-247
• Mink	-330
<b>Bonneville</b>	
• Lesser Scaup	+2,671
• Great Blue Heron	-4,300
• Canada Goose	-2,443
• Spotted Sandpiper	-2,767
• Yellow Warbler	-163
• Black-capped Chickadee	-1,022
• Mink	-1,622
<b>Dworshak</b>	
• Canada Goose-(breeding)	-16
• Black-capped Chickadee	-91
• River Otter	-4,312
• Pileated Woodpecker	-3,524
• Elk	-11,603
• White-tailed Deer	-8,906
• Canada Goose (wintering)	+323
• Bald Eagle	+2,678
• Osprey	+1,674
• Yellow Warbler	+119

**Table 11-4 (cont.) Estimated Losses Due to Hydropower Construction**  
*(losses are preceded by a “-”, gains by a “+”*

<b>Species</b>	<b>Total Habitat Units</b>
<b>Minidoka</b>	
• Mallard	+174
• Redhead	+4,475
• Western Grebe	+273
• Marsh Wren	+207
• Yellow Warbler	-342
• River Otter	-2,993
• Mule Deer	-3,413
• Sage Grouse	-3,755
<b>Chief Joseph</b>	
• Lesser Scaup	+1,440
• Sharp-tailed Grouse	-2,290
• Mule Deer	-1,992
• Spotted Sandpiper	-1,255
• Sage Grouse	-1,179
• Mink	-920
• Bobcat	-401
• Lewis' Woodpecker	-286
• Ring-necked Pheasant	-239
• Canada Goose	-213
• Yellow Warbler	-58

## APPENDIX D: PROVISIONAL STATEMENT OF BIOLOGICAL OBJECTIVES FOR ENVIRONMENTAL CHARACTERISTICS AT THE BASIN LEVEL

The following is a provisional set of environmental characteristic objectives for the basin level. The Council has asked the Independent Scientific Advisory Board to review these provisional basin level environmental characteristics by June 2001. The ISAB will report to the Council on the scientific soundness and basin-wide applicability of the environmental characteristics, as well as their utility for further defining biological objectives at the province and sub-basin levels. As part of its review, the ISAB should consider and report to the Council on the applicability of these objectives in the most altered areas of the basin, the blocked areas.

The Council will make the ISAB's report publicly available and seek views and comment from interested parties. The Council will consider the report of the ISAB and the views and comments of others on the report, and will confirm or revise these basin level objectives for environmental characteristics for purposes of providing guidance for sub-basin level planning and further program amendments.

### Provisional biological objectives for environmental characteristics at the basin level

Basin level environmental characteristics describe the kinds of changes that are needed across the Columbia basin to achieve the biological performance objectives called for by the program.

**1. Protect the areas and ecological functions that are at present relatively productive for fish and wildlife populations (e.g., the Hanford Reach fall chinook; spring chinook in the upper John Day River) to provide a base for expansion of healthy populations as we rehabilitate degraded habitats in other areas.**

- Protect and enhance habitats and ecological function to allow for the restoration of more natural population structures, by allowing for the expansion of productive populations and by habitat restoration actions that connect weak populations to stronger populations and to each other. Allow for the recovery of depleted and listed populations to at least the point of self-sustainability and a low probability of extinction.
  - Protection and expansion of habitats and ecological functions should allow for an increase in the number, complexity and range of multi-species fish and wildlife assemblages and communities. Increases in the productivity, abundance, and life-history diversity of specific fish and wildlife populations are dependent on, and should not be viewed in isolation from, these multi-species communities.
- 2. Protect and restore freshwater habitat for all life history stages of the key species. Protect and increase ecological connectivity between aquatic areas, riparian zones, floodplains and uplands.**
- Increase the connections between rivers and their floodplains, side channels and riparian zones.
  - Manage riparian areas to protect aquatic conditions and form a transition to floodplain terrestrial areas and side channels.
  - Identify, protect and restore the functions of key alluvial river reaches.
  - Reconnect restored tributary habitats to protected or restored mainstem habitats, especially in the area of productive mainstem populations.
- 3. Allow patterns of water flow to move more than at present toward the natural hydro-graphic pattern in terms of quantity, quality and fluctuation.**
- Habitat restoration may be framed in the context of measured trends in water quality.
  - Allow for seasonal fluctuations in flow. Stabilize daily fluctuations.
  - Increase the correspondence between water temperatures and the naturally-occurring regimes of temperatures throughout the basin.
  - Significantly reduce watershed erosion where human activities have accelerated sediment inputs.
- 4. Increase energy and nutrient connections within the system to increase productivity and expand biological communities.**
- 5. Allow for biological diversity to increase among and within populations and species to increase ecological resilience to environmental variability.**
- Expand the complexity and range of habitats to allow for greater life history and between species diversity.
  - Manage human activities to minimize artificial selection or limitation of life history traits.
  - Restoring habitat and access to habitat that establishes life history diversity is a priority.

**6. Increase genetic connections and gene flow within the ecological system to facilitate development, expansion and protection of population structures.**

- Increase the abundance and range of existing habitats and populations.
- Expand and connect existing habitat pockets to facilitate development of resilient population structures for aquatic communities.

**7. Identify, protect and restore ecosystem functions in the Columbia River estuary and nearshore ocean discharge plume as affected by actions within the Columbia River watershed.**

- Evaluate flow regulation, river operations and estuary-area habitat changes to better understand the relationship between estuary and near-shore plume characteristics and the productivity, abundance and diversity of salmon and steelhead populations.

**8. Enhance the natural expression of biological diversity in salmon and steelhead populations to accommodate mortality and environmental variability in the ocean.**

**9. Accept significant variation in the productivity, capacity and life-history diversity for any particular population over any particular time period, as part of the normal environmental condition. A measure of whether key ecological functions have increased sufficiently will be whether the system can accept normal environmental variation without collapse of the fish and wildlife population and community structure.**

*Basin and province level objectives must also describe expectations for the characteristics of the mainstem, estuary and ocean environments shared by all populations of salmon and steelhead in the subbasins. In other words, subbasin planners need to know what are the program's expectations or assumptions for survival of their respective populations in the parts of their life cycles outside the subbasins, including survival through the mainstem and in the estuary and ocean. For example, the objectives and strategies that planners would choose for a subbasin might vary substantially if expectations for juvenile survival through the mainstem over the planning period are 50 percent versus 90 percent.*



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