

NORTHWEST POWER PLANNING COUNCIL  
 **ISSUE BRIEF**  
APRIL 2003

**SUMMARY OF THE 2003 MAINSTEM AMENDMENTS TO THE  
COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM  
RELATING TO COLUMBIA AND SNAKE RIVER DAM OPERATIONS**

In its 2000 Columbia River Basin Fish and Wildlife Program, the first revision of the program since 1995, the Council committed to revise the 1995 program's recommendations regarding mainstem Columbia and Snake river dam operations in a separate rulemaking. That rulemaking commenced in 2001. On April 8, 2003, the Council adopted the new mainstem amendments.

The amendments adopt the biological objectives of the 2000 Biological Opinions on Operations of the Federal Columbia River Power System issued by NOAA Fisheries and the U.S. Fish and Wildlife Service. The Council proposes additional strategies for dam operations, as outlined below. The strategies are consistent with measures in the biological opinions.

The amendments are directed primarily at federal agencies with responsibilities for the Federal Columbia River Power System, but the Council also recommends collaborative actions that involve other entities including state fish and wildlife agencies, Indian tribes and non-federal dam operators. Four federal agencies implement the Council's fish and wildlife program. The U.S. Army Corps of Engineers owns and operates nine mainstem hydroelectric dams on the Columbia and Snake rivers, as well as two large storage reservoirs, Dworshak and Libby. The Bureau of Reclamation owns and operates Hungry Horse and Grand Coulee dams, and water storage reservoirs in the Snake River Basin above Hells Canyon. The Bonneville Power Administration sells the electricity generated by the federal power system. The Federal Energy Regulatory Commission licenses non-federal dams. The activities of two other federal agencies influence dam operations. These are NOAA Fisheries,

which implements the Endangered Species Act for salmon and steelhead, and the U.S. Fish and Wildlife Service, which implements the Endangered Species Act for Kootenai River white sturgeon and bull trout.

Collectively, these federal agencies will accomplish many of the objectives and measures in the Council's mainstem program, including water management, spill, juvenile fish transportation, adult fish passage, reservoir elevations and operations relating to resident fish and wildlife, water quality, mainstem habitat, and research.

Many of the provisions in the program call for tests of dam operations. The primary purposes for these tests are: 1) To determine the operation at each facility that provides the best benefits for fish populations over the long term. 2) To better quantify the benefits of the operations so that choices can be made to assure that the same survival benefits are achieved through the lowest-cost operations (e.g., spill tests). 3) There are some operations where the benefits of operations need to be more clearly demonstrated (e.g., flow augmentation).

The following are some of the major provisions and tests in the mainstem program:

**Consistency with the 2000 Biological Opinions**

- One of the overarching objectives for the program is to recover ESA-listed anadromous and resident fish. Thus, a key biological objective of the program is to achieve the biological performance standards for listed species stated in the 2000 biological opinions.

- The program adopts the biological objective measures of the biological opinions as part of the fish and wildlife program for the near term. However, based on the results of future monitoring and evaluation, the Council may recommend different operations if they would achieve the same or greater benefits at a lower cost.
- Certain assumptions and uncertainties in the biological opinions relating to spill, flow augmentation, reservoir drafting, predator control and harvest should be tested, and the Council calls on NOAA Fisheries and the U.S. Fish and Wildlife Service to exercise flexibility within the biological opinions to implement the tests.
- Bonneville, in coordination with the federal and state fish and wildlife agencies and Indian tribes, should define ESA harvest and recovery objectives for anadromous fish in the mainstem and tributaries.

### General Provisions Relating to Juvenile & Adult Fish Passage

- Strategies should protect biological diversity by benefiting the broad range of species, not just ESA-listed species.
- Actions to improve fish passage should emphasize adult survival.
- The Corps should report to the Council annually on how decisions on passage improvements take into account the strategies in the Council's program.
- The Corps should apply Value Engineering to all projects exceeding \$10 million.

### Juvenile Fish Transportation

- The amendments incorporate juvenile fish transportation measures in the NOAA Fisheries biological opinion. Priorities for transportation studies are:
  - Evaluate whether the survival benefits of transport from McNary Dam are sufficiently greater than inriver passage to justify continuing to transport from that dam.
  - Conduct a transportation study that targets Snake River fall chinook.
  - More clearly determine what delayed survival effects, if any, occur due to transport.

- Conduct annual evaluations of transportation effectiveness and report the results to the Council and the Independent Scientific Advisory Board.

### Mainstem Habitat

- The amendments adopt measures similar to those in the NOAA Fisheries biological opinion to 1) sample mainstem habitat, 2) develop habitat improvement plans in all mainstem river reaches, and 3) initiate improvements in three specific reaches. The amendments emphasize that the measures should benefit all species that utilize the mainstem as habitat and not just ESA-listed species.

### Spill

- When making spill decisions, priority should be given to: 1) minimizing impacts on returning adults, and 2) optimizing passage survival for fish that are important to the biological objectives of the Council's program, and that cannot be transported, or effectively transported (e.g., fish entering the Columbia River from tributaries above Bonneville Dam but below McNary Dam, Hanford Reach fall chinook and Snake River chinook).
- NOAA Fisheries and the Corps should consult with other federal and state agencies and tribes to determine an optimal passage strategy at each dam and for each passage route.
- Spill should be managed according to the most biologically effective level at each project. While spill is an effective passage method, the Council is concerned with the following aspects relating to spill:
  - Spilling to 120 percent gas supersaturation levels at some projects may increase mortality.
  - Spillway passage can also be the passage method most costly to the power system, especially in the summer.
  - The difference between spillway passage and other passage methods may be minimal, in some cases.
  - The maximum level of survival at each project may not be correlated with spill.
  - Spill may have negative effects on returning adults.

- The Council recommends the following studies:
  - Dam-specific estimates of smolt passage survival by species through spillways
  - Additional research on the biological impact of extended exposure to high levels of gas supersaturation.
  - More research on the interaction among spill, dissolved gas levels, adult passage, and adult survival.
  - The Corps and other agencies should immediately implement tests to examine the benefits of summer spill on juvenile fall chinook.
  - The Corps should continue testing removable spillway weirs (RSWs).

### Juvenile Bypass Systems

- Continue testing and developing surface bypass systems, taking into account the widest range of biological diversity, and using an expedited approach to prototype development.
- Relocate bypass outfalls where there is predation or problems with injury or mortality.
- Modify turbines to improve juvenile survival.
- Conduct research on fish diseases at fish passage facilities.

### Adult Passage

- The Corps should improve the overall effectiveness of the adult fish passage program. This includes expediting schedules to design and install improvements to fish passage facilities.
- Where it is beneficial, cool water releases from reservoirs should continue to be used to facilitate adult migration.
- The Corps should treat adult migration as a priority and report annually to the Council on its progress to correct existing problems.
- PIT-tag detectors should be installed at projects that don't have them.
- Fish counting accuracy should be improved.
- Research should be conducted on fish diseases at passage facilities.

### Mainstem Water Management Strategies to Benefit All Fish and Wildlife

- The general guidelines in the Council's program include:
  - Manage water through the hydrosystem to more closely approximate the natural hydrograph.
  - Allow for seasonal fluctuations in flow. Reduce large and rapid short-term fluctuations.
  - Increase the correspondence between water temperatures and naturally occurring temperatures throughout the Basin. Use stored water to manage water temperatures below storage reservoirs.
- NOAA Fisheries and the U.S. Fish and Wildlife Service should identify potential conflicts and seek recommendations on how best to balance different needs prior to implementation of flow actions. The amendments also call on the federal agencies to report annually on flow augmentation, its benefits and the attributes that make it beneficial.
- The Council recognizes the continuing controversy over the flow-survival relationship, and will work with others in the region to:
  - Evaluate the validity of flow targets and flow augmentation actions in the 2000 Biological Opinion.
  - Evaluate how often, and for what duration, river flows meet the spring and summer flow targets in the Biological Opinion.
  - Quantify the volume and shape of water that has been, and is being, provided as flow augmentation.
- The 2000 NOAA Fisheries and USFWS biological opinion operations may not be optimal when the needs of fish and wildlife other than listed species are taken into account. Based on the vision, biological objectives and overarching strategies stated earlier, the Council adopted water management and other specific strategies to benefit all fish and wildlife affected by the hydrosystem, not just listed species. Where the strategies intended to benefit non-listed species appear to conflict with the biological opinions, the Council does not mean that the federal operating agencies should act contrary to the biological opinions in order to implement strategies in the program. The Council intends instead that the federal operating agencies make every effort practicable to use the operational flexibility in the biological opinions to

- meet the biological opinion requirements and implement the other strategies in the Council's program. The Council believes the agencies have sufficient operational flexibility in most cases to implement these additional strategies, which include the following provisions:
- Spring and summer operations at Libby and Hungry Horse dams
    - Continue to implement the VARQ flood control operations and implement Integrated Rule Curve operations as recommended by Montana Fish, Wildlife & Parks.
    - With regard to operations to benefit Kootenai River white sturgeon, the Council recommends a refinement to operations in the biological opinion that specify a "tiered" strategy for flow augmentation from Libby Dam to simulate a natural spring freshet.
    - Refill should be a high priority for spring operations so that the reservoirs have the maximum amount of water available during the summer.
    - Implement an experiment to evaluate the following interim summer operation:
      - Summer drafting limits at Libby and Hungry Horse should be 10 feet from full pool by the end of September in all years except during droughts when the draft could be increased to 20 feet.
      - Draft each reservoir in a stable or "flat" weekly average outflows from July through September. This will result in reduced drafting compared to the biological opinion.
      - The focus of the experiment should be on 1) ascertaining the nature, extent of and reasons for a flow-survival relationship through the lower Columbia system; 2) determining whether flow augmentation from the upper Columbia storage projects has any effect on levels of survival, and 3) determining the benefits to resident fish.
  - Spring, summer and fall operations at Grand Coulee Dam
    - Operate Grand Coulee Dam in the winter and spring (from January through June) consistent with biological opinion operations and ordinary hydrosystem operations. The amendments recommend minimum monthly elevation targets in Lake Roosevelt and minimum monthly mean water retention times with a goal of refilling by the end of June.
  - Spring and summer water management in the Snake River
    - Draft evenly from Lake Roosevelt to the target elevation by the end of August. As much as possible, manage the reservoir and dam discharges to minimize fluctuations and ramping rates and produce steady flows across each season and each day to minimize reservoir fluctuations and ramping rates. Attempt to draft no lower than 1,283 feet by the end of August.
    - From September through December, attempt to maintain a minimum elevation of 1,283 feet to maximize water retention times and protect kokanee access and spawning. Federal operators, fish and wildlife managers, and others should consult with the Council to determine how to provide the biological benefits of a 1283 operation while meeting biological opinion requirements, including chum flows and operating to protect flows for the Hanford Reach.
    - Attempt to maximize water retention times from June to December of 40 to 60 days, or the maximum historically achievable for each month.
    - Two high priorities for Grand Coulee through the year should be to contribute to the establishment and protection of the necessary conditions for fall chinook salmon in the Hanford Reach and to refill by the end of June. Summer and fall operations should be consistent with these priorities.
  - Spring and summer water management in the Snake River
    - Spring and summer water management in the Snake River should be consistent with NOAA Fisheries' 2000 Biological Opinion, with the following additional observations:
      - If water is provided from the Hells Canyon projects or from storage reservoirs in the upper Snake River basin, the releases must be consistent with state and federal law.
      - The Council encourages the Bonneville Power Administration, Idaho Power Company, and the Bureau of Reclamation to execute a water shaping agreement to ensure that flows from Brownlee Reservoir will occur to assist juvenile and adult migration when most needed, at the call of the Technical Management Team (TMT).

- Because flow targets often are unattainable, it is ineffective and uneconomical to strive to meet them regardless of the degree of biological benefit obtained.
- Summer operations at Dworshak Dam
  - Operate Dworshak Dam consistent with the provisions of the 2000 Biological Opinion as implemented through the Corps acting as a member of, and in coordination with, the Technical Management Team.
  - The ISAB and the IEAB shall review the operation of Dworshak to assess the adverse impacts of those operations on resident fish and wildlife and adverse impacts on the economy of Clearwater County.
- Hanford Reach/mainstem and estuary spawning, rearing, and resting habitat
  - The Council recommends managing flows to protect, improve, and expand spawning, rearing, and resting habitat in the mainstem and estuary. This means the Bureau of Reclamation, as the operator of Grand Coulee Dam, and the operators of the mid-Columbia dams will have to take steps, separately and together, to further reduce flow fluctuations through the Reach that affect spawning and rearing.



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