

## Hatchery Reform

**T**HE FIRST SALMON HATCHERY in the Northwest was built in 1877 on the Clackamas River, south of Portland. Many more followed, all designed to boost sagging salmon returns to the Columbia River. Today, there are approximately 300 salmon and steelhead hatchery programs in the Columbia River Basin, accounting for approximately 90 percent of all salmon and steelhead caught in the Columbia River and its tributaries.

According to an estimate developed by the Northwest Power Planning Council in 2005, recreational and commercial fisheries generate nearly \$150 million per year in economic benefits by harvesting those fish. Whether or not that estimate is accurate, there is no doubt that Columbia River fisheries play an important role in the economy of Washington, Oregon and all who share in the harvest of hatchery-reared salmon.

At the same time, fishery managers cannot ignore scientific evidence that hatchery fish pose a risk to natural populations of salmon and steelhead, including those listed for protection under the federal Endangered Species Act (ESA). This has already prompted changes in hatchery operations on both sides of the Columbia River, and is certain to require more changes in the future. The Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW), U.S. Fish and Wildlife Service and Columbia River treaty tribes have recently developed a new plan to reform hatchery operations throughout the Columbia River, with support from the National Marine Fisheries Service (NMFS).

### **Pressures for Reform**

The Lower Columbia Basin Salmon Recovery Plan, adopted by NMFS in 2005, describes the challenge facing fishery managers regarding hatchery fish. Noting that “hatcheries provide valuable mitigation and conservation benefits,” it goes on to say that those facilities may also cause “significant adverse impacts” to runs of wild salmon “if not prudently and properly deployed”:

*Risks to wild fish include genetic deterioration, reduced fitness and survival, ecological effects such as competition or predation, facility effects on passage and water quality, mixed stock fishery effects, and confounding the accuracy of wild population status estimates.*

Lower Columbia River Salmon Recovery Plan – 2004

The Hatchery Scientific Review Group (HSRG), an independent group of scientists appointed by Congress in 2000 to assess hatcheries throughout the Pacific Northwest, echoes these concerns. The HSRG completed an assessment of hatcheries below Bonneville Dam in the summer of 2007 and is expected to finalize its review of all

Columbia River hatcheries by December 2008. For the lower river, the HSRG found that excessive numbers of hatchery fish are spawning in areas utilized by the nine primary wild Chinook populations and the 10 primary wild coho populations in the area. This is a natural outcome of large hatchery production programs in areas with relatively small natural populations, the scientific group concluded.

For both species, the HSRG recommends strict controls on the proportion of hatchery fish allowed to spawn naturally from both segregated and integrated hatchery programs. For segregated populations, in which hatchery fish are not expected to have a genetic connection to wild fish, the HSRG recommends that hatchery fish surviving to the spawning grounds not exceed 5% of the total spawning population. For integrated populations, where hatchery fish bear the genetic traits of wild fish, wild salmon should exceed the proportion of hatchery fish on the spawning grounds by a ratio of 2 to 1.

In response to these and other findings, NMFS plans to condition federal funding for hatcheries on their compliance with salmon-recovery plans consistent with the ESA. This approach is expected to affect hatchery funding provided under the federal Mitchell Act, starting in fiscal year 2009.

### **Conservation and Sustainable Fisheries Plan**

In August 2008, WDFW released a plan to realign hatchery production in the Columbia River Basin to provide greater support for wild salmon and steelhead, while also maintaining sustainable fisheries. With encouragement from NMFS, the Conservation and Sustainable Fisheries Plan has been expanded to become a multi-agency initiative involving ODFW, the U.S. Fish and Wildlife Service and Columbia River treaty tribes.

The new plan is based on a three-tiered management system for salmon and steelhead, included in the Lower Columbia Basin Salmon Recovery Plan and recommended by the HSRG. Under the new multi-agency plan, wild salmonid populations will be classified as *primary*, *contributing* or *stabilizing*, according to their contribution to recovery. Primary populations are those that make the greatest contribution to recovery, stabilizing populations the least.

These classifications will drive the level of changes required in various watersheds throughout the Columbia River Basin. Actions will be evaluated for their effectiveness at achieving the proper abundance and productivity levels for populations in different classifications.

Consistent with that approach, WDFW plans to:

- Establish “refuge streams” where no hatchery fish will be released but where some fishing may occur. A total of five refuge streams have been identified for Chinook, four for coho and three for steelhead to support recovery of listed species.
- Convert some harvest programs for coho and steelhead to small conservation hatchery programs, which will contribute to rebuilding wild stocks.

- Install new weirs in the lower portions of two streams and upgrade three other existing weirs in streams to assist in recovery of listed Chinook populations.

To support these efforts, WDFW has developed broodstock management plans that define the ratio of naturally produced fish to be incorporated into each hatchery program to improve the overall fitness of fish released by state hatcheries and the resultant naturally spawning populations.

A key strategy of the Conservation and Sustainable Fisheries Plan is to achieve recovery goals by redistributing hatchery production, wherever possible. While the plan reduces or eliminates production in some locations, it increases production in others, thereby making changes necessary to achieve recovery goals while maintaining more than 90% of salmon and steelhead production.

### Washington and Oregon Salmon and Steelhead Classifications

Primary (P), contributing (C), and stabilizing (S) population designations for the recovery scenario. Changes are marked with a strikethrough. Primary populations identified for greater than high viability objectives are denoted with an '\*'.  
 Coho<sup>1</sup>

|                |                        | Fall Chinook (tule)    | Fall Chinook (bright) | Spring Chinook        | Chum      | Winter steelhead      | Summer steelhead      | Coho <sup>1</sup>     |
|----------------|------------------------|------------------------|-----------------------|-----------------------|-----------|-----------------------|-----------------------|-----------------------|
| <b>COAST</b>   | Grays/Chinook          | <b>P</b>               | --                    | --                    | <b>P*</b> | <b>P</b>              | --                    | <b>P</b>              |
|                | Elochoman/Skamokawa    | <b>P</b>               | --                    | --                    | <b>P</b>  | <b>C</b>              | --                    | <b>P</b>              |
|                | Mill/Abernathy/Germany | <b>C</b>               | --                    | --                    | <b>P</b>  | <b>P</b>              | --                    | <b>C</b>              |
|                | Youngs Bay (OR)        | <del><b>S-C</b></del>  | --                    | --                    | <b>P</b>  | na                    | --                    | <b>S</b>              |
|                | Big Creek (OR)         | <del><b>S-C</b></del>  | --                    | --                    | <b>C</b>  | na                    | --                    | <del><b>P-C</b></del> |
|                | Clatskanie (OR)        | <b>P</b>               | --                    | --                    | <b>C</b>  | na                    | --                    | <del><b>S-P</b></del> |
|                | Scappoose (OR)         | <del><b>S-C</b></del>  | --                    | --                    | <b>C</b>  | na                    | --                    | <b>P</b>              |
| <b>CASCADE</b> | Lower Cowlitz          | <b>C</b>               | --                    | --                    | <b>C</b>  | <b>C</b>              | --                    | <del><b>P-C</b></del> |
|                | Upper Cowlitz          | <b>S</b>               | --                    | <b>P*</b>             | --        | <b>C</b>              | --                    | <del><b>C-P</b></del> |
|                | Cispus                 | --                     | --                    | <b>P*</b>             | --        | <b>C</b>              | --                    | <b>C</b>              |
|                | Tilton                 | --                     | --                    | <b>S</b>              | --        | <b>C</b>              | --                    | <b>C</b>              |
|                | SF Toutle              | <b>X</b>               | --                    | <b>C</b>              | <b>X</b>  | <b>P*</b>             | --                    | <b>P</b>              |
|                | NF Toutle              | <del><b>S-P*</b></del> | --                    | <b>X</b>              | <b>X</b>  | <b>P</b>              | --                    | <b>P</b>              |
|                | Coweeman               | <b>P*</b>              | --                    | --                    | <b>X</b>  | <b>P</b>              | --                    | <b>P</b>              |
|                | Kalama                 | <del><b>P-S</b></del>  | --                    | <del><b>P-C</b></del> | <b>C</b>  | <b>P*</b>             | <b>P</b>              | <del><b>C-S</b></del> |
|                | Lewis (NF)             | <b>X</b>               | <b>P*</b>             | <b>P</b>              | <b>X</b>  | <del><b>C-S</b></del> | <b>S</b>              | <del><b>C-S</b></del> |
|                | Lewis (EF)             | <b>P*</b>              | --                    | --                    | <b>P</b>  | <del><b>P-C</b></del> | <b>P</b>              | <b>P</b>              |
|                | Salmon                 | <b>S</b>               | --                    | --                    | <b>S</b>  | <b>S</b>              | --                    | <b>S</b>              |
|                | Washougal              | <b>P*</b>              | --                    | --                    | <b>P*</b> | <b>C</b>              | <del><b>P-C</b></del> | <b>C</b>              |
|                | Sandy (OR)             | <del><b>S-C</b></del>  | <b>P*</b>             | <b>P*</b>             | <b>P</b>  | <b>P</b>              | --                    | <b>P</b>              |
|                | Clackamas (OR)         | <b>C</b>               | --                    | <b>P<sup>1</sup></b>  | <b>C</b>  | <b>P</b>              | --                    | <b>P*</b>             |
| <b>GORGE</b>   | Lower Gorge            | <b>C</b>               | --                    | --                    | <b>P*</b> | <b>P</b>              | --                    | <b>P</b>              |
|                | Upper Gorge            | <del><b>S-C</b></del>  | --                    | --                    | <b>C</b>  | <b>S</b>              | <b>P*</b>             | <b>P</b>              |
|                | White Salmon           | <b>C</b>               | --                    | <b>C</b>              | --        | --                    | --                    | <b>X</b>              |
|                | Hood / U. Gorge (OR)   | <b>P</b>               | --                    | <b>P</b>              | --        | <b>P*</b>             | <b>P</b>              | <del><b>C-P</b></del> |

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Specifically, the plan maintains 95% of the lower river tule fall Chinook production, 91% of the early-returning Type S coho production, 94% of the late-returning Type N coho production, 96% of the current summer steelhead production and 94% of the current winter steelhead production. The plan also maintains production levels necessary to meet commitments to provide salmon and steelhead for fisheries above Bonneville Dam, as established under the recent *U.S. v. Oregon* agreement.

Based on an evaluation of current production programs in relation to recovery needs and population classifications, the plan is designed to expedite recovery of listed stocks while continuing to support sustainable in-river and ocean fisheries.

### **Future Considerations**

Hatchery reform poses some major, unavoidable challenges for fisheries management in the Columbia River Basin. Hatchery programs are the backbone of recreational, commercial and tribal fisheries, yet the evidence is clear that those programs must be realigned to avoid impeding recovery of listed stocks. Moreover, future funding under the Mitchell Act will depend on the success of those efforts.

Once implemented, the Conservation and Sustainable Fisheries Plan is expected to produce operational savings that will be reinvested in facility maintenance needed to realign hatchery programs. But making the changes necessary to reform the hatchery system will require additional funding for capital improvements, beyond the levels currently provided under the Mitchell Act. In fact, federal support for facilities funded under that law has steadily declined over the past decade as operating costs and requirements have continued to increase.

In 2007, WDFW and ODFW foresaw a funding shortfall necessary to implement hatchery reform in the Columbia River Basin and requested an additional allocation of \$2.5 million. These funds were not, however, included in the federal budget proposed for 2009. Without the funds to implement the multi-agency plan, additional reductions in production likely will be required that will affect fisheries in the lower Columbia River beyond the systemic changes designed to support salmon recovery. The Columbia River Fish Working Group can play an important role in helping to develop strategies for meeting these challenges.