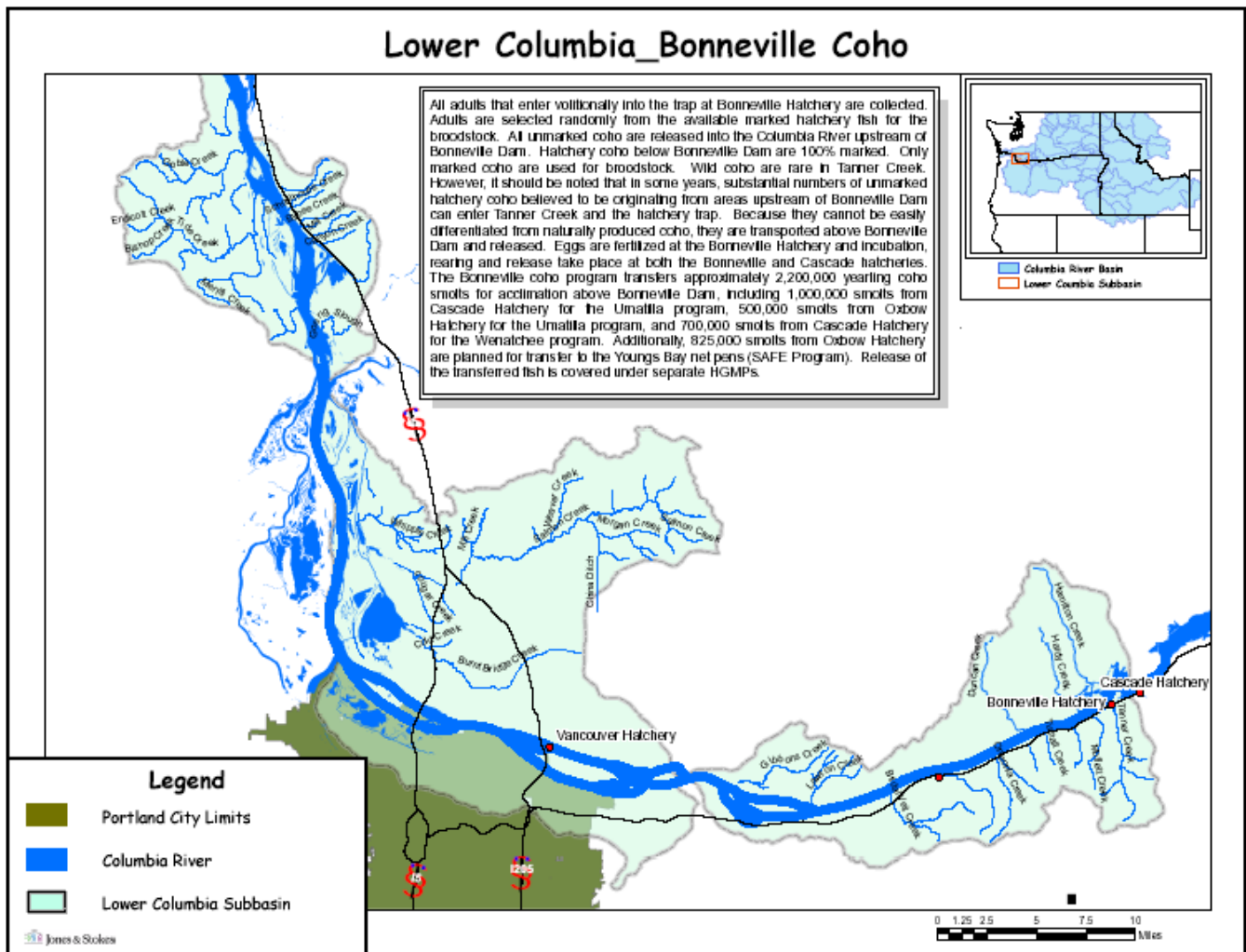


Hatchery Scientific Review Group Review and Recommendations

Bonneville Hatchery Coho Population and Hatchery Programs

January 31, 2009



1 Bonneville Hatchery Coho

2 Current Conditions

2.1 Current Population Status and Goals

The lower Columbia Bonneville coho population is a hatchery population that is included as part of the Lower Columbia River Coho ESU and is listed as threatened under the ESA. This population has no viability or recovery goals. It is maintained from returns of hatchery origin adults to the Bonneville Hatchery.

- **ESA Status:** This population is listed as threatened and is part of the Lower Columbia River coho ESU.
- **Population Description:** This is a hatchery population maintained through hatchery returns. There is no natural population associated with the Bonneville Hatchery program.
- **Current Viability Rating:** NA
- **Recovery Goal for Abundance:** NA
- **Productivity Improvement Expectation:** NA
- **Habitat Productivity and Capacity:** NA; this is a segregated hatchery population.
- **Populations Affected by this Hatchery Population Include:** These fish are likely to contribute to minor spawning aggregations in the lower Columbia River Gorge, particularly in the vicinity of the hatchery. No information was provided to indicate the scale of this straying.

2.2 Current Hatchery Programs Affecting this Population

The program attempts to meet harvest goals through the release of 1.25 million yearlings on-station at the Bonneville Hatchery. All on-station releases are identifiable by adipose fin clip and/or coded-wire tag. Each of the two release groups is represented by a 25,000 fish coded-wire tagged group. The program is described as a segregated harvest program and the broodstock is maintained from marked hatchery fish returning to the facility.

This hatchery program dates back to 1938. Historically, broodstock were collected at Eagle Creek, Herman Creek and Tanner Creek. In addition to local coho, fish were transferred into this broodstock from several other locations in the Columbia River, including Big Creek and Sandy hatcheries. This stock is a mixed, domesticated stock. It is assumed to have genetic and biological differences from the ancestral stocks in the area.

A portion of the production (approximately 500,000 fish) is maintained full-term at Bonneville Hatchery. Approximately 750,000 fish are incubated and reared at Oxbow Hatchery prior to return to Bonneville for release. Broodstock from this program also supports the select area fishery, Umatilla River, and Wenatchee River coho programs. Mating protocols use single family pairing but a few jacks are used for spawning (approximately 0.5%). Total survival from the program averaged 1.77% from brood years 1990 through 1999. On average, the program contributes approximately 8,500 fish annually to harvest.

3 HSRG Review

The HSRG has developed guidelines for minimal conditions that must be met for each type of program as a function of the biological significance of the natural populations they affect. For populations of the highest biological significance, referred to as Primary, the proportion of

effective hatchery origin spawners (pHOS) should be less than 5% of the naturally spawning population, unless the hatchery population is integrated with the natural population. For integrated populations, the proportion of natural-origin adults in the broodstock should exceed pHOS by at least a factor of two, corresponding to a proportionate natural influence (PNI) value of 0.67 or greater. For Contributing populations, the corresponding guidelines are: pHOS less than 10% or PNI greater than 0.5. It is important to note that these represent minimal conditions, not targets. For example, the potential for fitness loss when effective pHOS is 5% is significantly greater than it would be at 3%. For Stabilizing populations, we assume the current pHOS or PNI would be maintained.

The HSRG analyzed the current condition and a range of hatchery management options for this population, including the effect of removing all hatchery influence, and arrived at one or more proposed solutions intended to address the manager's goals consistent with the HSRG guidelines for Primary, Contributing, and Stabilizing populations. The solution included in the cumulative analysis is the last option described in the Observations and Recommendation box below.

In order to highlight the importance of the environmental context, two habitat scenarios were considered: current conditions and a hypothetical 10% habitat quality improvement.

See HSRG Observations and Recommendations in the box below for more information.

3.1 Effect on Population of Removing Hatchery

The No Hatchery scenario is intended to look at the potential of the natural population absent all hatchery effects with projected improved fish passage survival in the Snake and Columbia mainstem (FCRPS Biological Opinion May 5, 2008).

Since this is a segregated hatchery population, the No Hatchery scenario would have no impact on the adjusted productivity or natural-origin spawners. Harvest contribution of the hatchery population would go from approximately 8,475 fish to zero under the No Hatchery scenario.

3.2 HSRG Observations/Recommendations

In the Observation and Recommendation box below we describe elements of the current situation (Observations) that were important to evaluate the natural population and where applicable, the hatchery program(s) affecting that population. We also describe a solution (Recommendations) that appeared to be consistent with manager's goals; however, this is not the only solution. In some cases, more than one solution is described.

Summary results of this analysis are presented in Table 1. The adjusted productivity values reported for each alternative incorporates all factors affecting productivity (i.e., habitat quality, hatchery fitness effects, and harvest rates).

Observations

The current program releases approximately 1,250,000 smolts to meet harvest goals. Insufficient information about the scale and distribution of straying from this hatchery population was available during the HSRG’s review. There is a great deal of uncertainty as to whether program fish are adequately segregated from naturally spawning aggregates or whether there are any important natural spawning aggregates in nearby streams within the ESU or upstream of Bonneville Dam.

Recommendations

The HSRG recommends continuing the program as operated with 100% adipose fin clipping, increased coded-wire tagging, and increased monitoring of natural populations to determine the actual contribution of hatchery strays to important spawning aggregations. The proportion of jacks used in the spawning protocol should be increased.

This program is a candidate to provide broodstock for net pen programs in the Columbia Estuary. The on-station release could be reduced to approximately 750,000 fish with transfer of the remaining production (approximately 500,000 fish) to a select area fishery release site.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Bonneville Hatchery Coho. The light green row indicates the natural population and yellow indicates the segregated hatchery population, if applicable. A 10% habitat improvement is applied to the HSRG Solution to evaluate the additional effect of improved habitat towards conservation objectives. objectives.

Alternative	Type and Purpose	Prog Size (/1000)	HOR Recapture	Additional Weir Efficiency	Effective pHOS	PNI	NOS Esc	Adj Prod	Harvest	Hatchery Surplus
Current										
	Seg Harv	1,247.7	90%						8,475	8,545
No Hatchery										
HSRG Solution										
	Seg Harv	750.5	95%						6,935	2,005
HSRG Solution w/ Improved Habitat										
	Seg Harv	750.5	95%						6,935	2,005