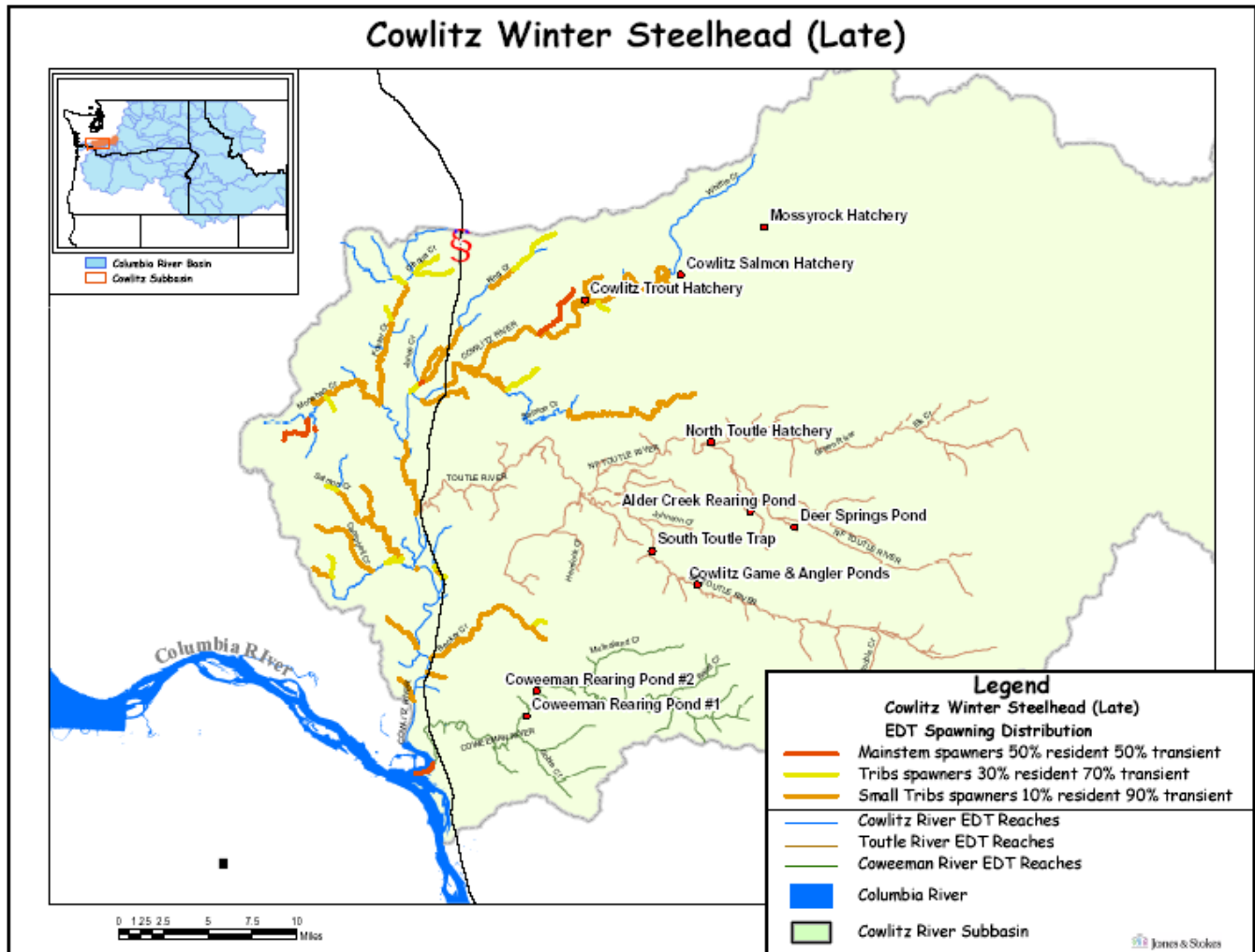


Hatchery Scientific Review Group Review and Recommendations

Lower Cowlitz River Winter Steelhead Population and Related Hatchery Programs

January 31, 2009



1 Lower Cowlitz Winter Steelhead

There are no adequate abundance trend data available for Cowlitz winter steelhead, so their status was identified as Unknown in 2002. The status may be considered Depressed because access to 80 percent of their historic habitat has been lost due to dam construction. Cowlitz winter steelhead were identified as a stock based on their distinct spawning distribution (SaSSI 2002).

Most spawning downstream of Mayfield Dam takes place in the lower mainstem Cowlitz River and in Ostrander and Salmon creeks. Spawning also takes place in Olequa, Stillwater, Whittle, Arkansas, and Delameter creeks. Cowlitz winter steelhead are trucked above the three dams on the Cowlitz River and released into the Tilton River and Lake Scanewa, the uppermost reservoir. Spawning occurs in the Tilton River, the Cispus River and its tributaries, and the upper Cowlitz and its tributaries. Spawning generally occurs from March to early June (SaSSI 2002).

No genetic analysis has been done on naturally spawning Cowlitz winter steelhead. Cowlitz Hatchery late winter steelhead, derived from native broodstock, were sampled in 1996; however, comparisons of allele frequencies between this stock and other lower Columbia steelhead stocks for determining stock distinctiveness are not very informative (Myers et al. 2002).

2 Current Conditions

2.1 Current Population Status and Goals

The Cowlitz River is habitat for native late stock winter steelhead that are ESA-listed as threatened. The lower Cowlitz supports substantial summer and winter steelhead fisheries based on the hatchery programs. Significant winter steelhead habitat exists in the upper Cowlitz (above Cowlitz Falls Dam) to which adult fish are transported. This separation and transportation effort allows managers to remove any number of hatchery fish from this upper habitat. The upper basin therefore can be managed for native fish recovery regardless of management policies in the lower basin.

- ESA Status: This population is listed as threatened and is part of the Lower Columbia River Steelhead ESU.
- Population Description: Contributing
- Current Viability Rating: Low
- Recovery Goal for Abundance: 400
- Productivity Improvement Expectation: 5%
- Habitat Productivity and Capacity (from EDT): Productivity: 2.80; Capacity: 866
- Populations Affected by this Hatchery Population Include: Cowlitz winter steelhead
- Current Hatchery Programs Affecting this Population:

2.2 Current Hatchery Programs Affecting this Population

Three hatchery steelhead programs are operated in the basin: (1) a native late winter program of 288,000 smolts in the lower river, 75,000 smolts released above Cowlitz Falls Dam for passage tests, and 200,000 fingerlings planted above Cowlitz Falls Dam as part of the reintroduction plan; (2) a segregated hatchery early winter program of 300,000 smolts; and (3) a segregated hatchery summer component of 450,000 smolts released at the hatchery and 100,000 smolts released in the lower river from a co-op. There are no native summer steelhead in the Cowlitz River.

- PNI and pHOS Estimates (include straying from all hatchery programs): 14%
- Estimated Productivity (with harvest and fitness factors adjusted from AHA): 1.31
- Projected Average Natural Origin Escapement: 468

Average Harvest Contribution: 11,607 steelhead (all programs)

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).

Our analysis estimated Adjusted Productivity (with harvest and fitness factor effects from AHA) would increase from 1.3 to 2.6. Average abundance of natural-origin spawners (NOS) would increase from 468 to 714. Harvest contribution of the natural and hatchery populations would go from 11,607 to 41.

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

This population has been designated as a Contributing population in the lower Columbia ESU and is affected by three hatchery steelhead programs: (1) a native late winter program of 288,000 smolts in the lower river, 75,000 smolts released above Cowlitz Falls Dam for passage tests, and 200,000 fingerlings planted above Cowlitz Falls Dam as part of the reintroduction plan; (2) , a segregated hatchery early winter program of 300,000 smolts; and (3) a segregated hatchery summer component of 450,000 smolts released at the hatchery and 100,000 smolts released in the lower river from a co-op site. The program is exceeding the guidelines for a Contributing population. The percent of hatchery fish on the spawning grounds is close to 50%, which results in an effective pHOS greater than 10%.

To meet the standards for a Contributing population, the total smolt release from each of the harvest programs would need to be reduced by half.

The management intent is to transition to an integrated program for the late winter steelhead. In addition, a settlement agreement with Tacoma Power is now in place that includes reintroduction of the late winter component into the upper watershed.

Recommendations

If this population were designated as Stabilizing, then current programs could be retained, continuing the transition of the late winter integrated program.

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

Alternative	Type and Purpose	Prog Size (/1000)	HOR Recapture	Additional Weir Efficiency	Effective pHOS	PNI	NOS Esc	Adj Prod	Harvest	Hatchery Surplus
Current	Int Harv	288.7	90%	0%	14%	0.00	468	1.3	557	75
	Seg Harv	302.4	75%						2,399	939
	Summer Stlhd Seg Harv	549.2	95%						8,650	2,925
No Hatchery	None None	-	0%	0%	0%	1.00	714	2.6	41	-
HSRG Solution	Int Harv	288.7	90%	0%	19%	0.72	635	2.3	2,041	1,041
	Seg Harv	302.4	75%						2,399	939
	Summer Stlhd Seg Harv	549.2	95%						8,650	2,925
HSRG Solution w/ Improved Habitat	Int Harv	288.7	90%	0%	17%	0.75	739	2.5	2,047	1,041
	Seg Harv	302.4	75%						2,399	939
	Summer Stlhd Seg Harv	549.2	95%						8,650	2,925