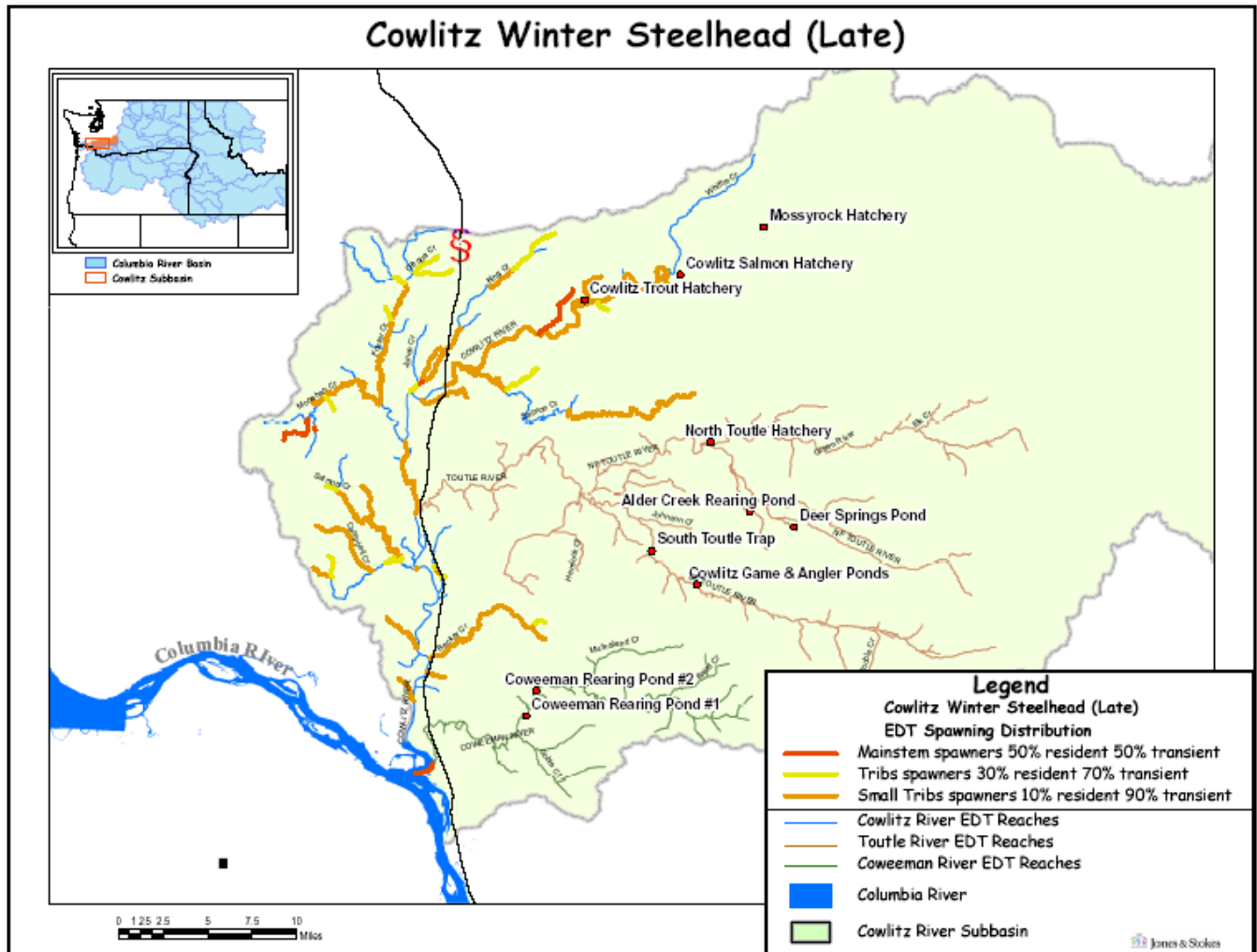


Hatchery Scientific Review Group Review and Recommendations

Upper Cowlitz River Winter Steelhead Population and Related Hatchery Programs

January 31, 2009



1 Upper Cowlitz River Winter Steelhead

The Cowlitz system had six historical populations that included three core populations (Cispus, Upper Cowlitz and North Fork Toutle). Three mainstem dams on the Cowlitz River have blocked access to all historical habitat for this population. The Upper Cowlitz population is now being reintroduced: late winter steelhead have been transferred upstream since 1996. In 2004, 35,032 steelhead smolts were collected at the Cowlitz Falls Fish Facility, of which 11,276 (32%) were of wild origin. Fry plants identified by right ventral clip contribute to the escapement, while yearling plants of right ventral and adipose fin clips (37,500) provide some level of harvest on identified steelhead for the upper basin.

2 Current Conditions

2.1 Current Population Status and Goals

The native late stock winter steelhead are ESA-listed as threatened. The lower Cowlitz supports substantial summer and winter steelhead fisheries based on other 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 can therefore be managed for native fish recovery regardless of management policies in the lower basin.

- ESA Status: Native Cowlitz late winter steelhead are listed as threatened and are part of the Lower Columbia River Steelhead DPS.
- Population Description: Contributing
- Current Viability Rating: Very Low
- Recovery Goal for Abundance: Unknown
- Productivity Improvement Expectation: Unknown
- Habitat Productivity and Capacity (from EDT): Productivity: 1.26; Capacity: 1,060

2.2 Current Hatchery Programs Affecting this Population

The current program releases approximately 75,000 smolt and 200,000 parr into the upper basin. These fish are of late winter hatchery-origin. Parr are marked with ventral fin-clip. All recovered adults are passed upstream. Also, unmarked late-timed adult steelhead captured at the Cowlitz Fish Hatchery are passed upstream.

- PNI and pHOS Estimates (include straying from all hatchery programs): PNI is 0.0 and pHOS is 0%
- Estimated Productivity (with harvest, fitness factors and a 40% FGE at Cowlitz Falls from AHA): 1.2
- Projected Average Natural Origin Escapement: 239 into the upper Cowlitz
- Average Harvest Contribution: 35 late winter steelhead
- Hatchery strays from in-basin integrated hatchery program – from AHA summary: 2
Hatchery strays from in-basin segregated and out-of-basin hatchery programs – from AHA summary: 0

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 remain the same at 1.2. Average abundance of natural origin spawners (NOS) would remain the same at approximately 350 fish. Harvest contribution of the natural and hatchery populations would go from approximately 30 fish to approximately 20 fish.

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 is a reintroduction program releasing smolts and parr into the upper basin. These fish are of late winter hatchery-origin. Parr are marked with ventral fin-clips. With a recruit/spawner estimate of 0.2, the parr releases do not appear to be successful at producing adult returns. All recovered adults are passed upstream. Also, unmarked late-timed adult steelhead captured at the Cowlitz Fish Hatchery are passed upstream. Even with juvenile fish collection efficiency estimated at 40%, it appears that the re-introduction is being successful and this population may be able to sustain itself. Natural-origin adult returns from the re-introduction efforts have increased annually from less than 300 adults (2004) to 544 and 622 adults in 2006 and 2007, respectively.

Recommendations

The HSRG has two alternatives for this program depending on the ability of this population to sustain itself. If the population is achieving levels of productivity and fish passage that can lead to sustainability, hatchery programs in the upper Cowlitz River should be suspended and testing for self-sustainability should begin. This would include suspending the introduction of adults from the current lower river segregated program. If these points have not yet been reached, we recommend modifying the current program to an integrated conservation program (PNI = 0.72) taking 100% natural-origin broodstock (50 adults) from fish returning to the upper Cowlitz. Approximately 100,000 smolts derived from this broodstock would be released below the barrier dam to improve survival over the current approach of releasing juveniles in the upper watershed. Upon return, all adults from this program would be transported to the upper watershed and be allowed to distribute themselves and spawn naturally.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Upper Cowlitz Winter Steelhead. 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.

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	199.1	75%	100%	0%	1.00	354	1.2	34	9
No Hatchery	None None	-	0%	0%	0%	0.00	354	1.2	21	-
HSRG Solution	Int Harv	99.3	0%	0%	39%	0.72	559	1.0	724	1
HSRG Solution w/ Improved Habitat	Int Harv	99.3	0%	0%	35%	0.74	659	1.1	730	1