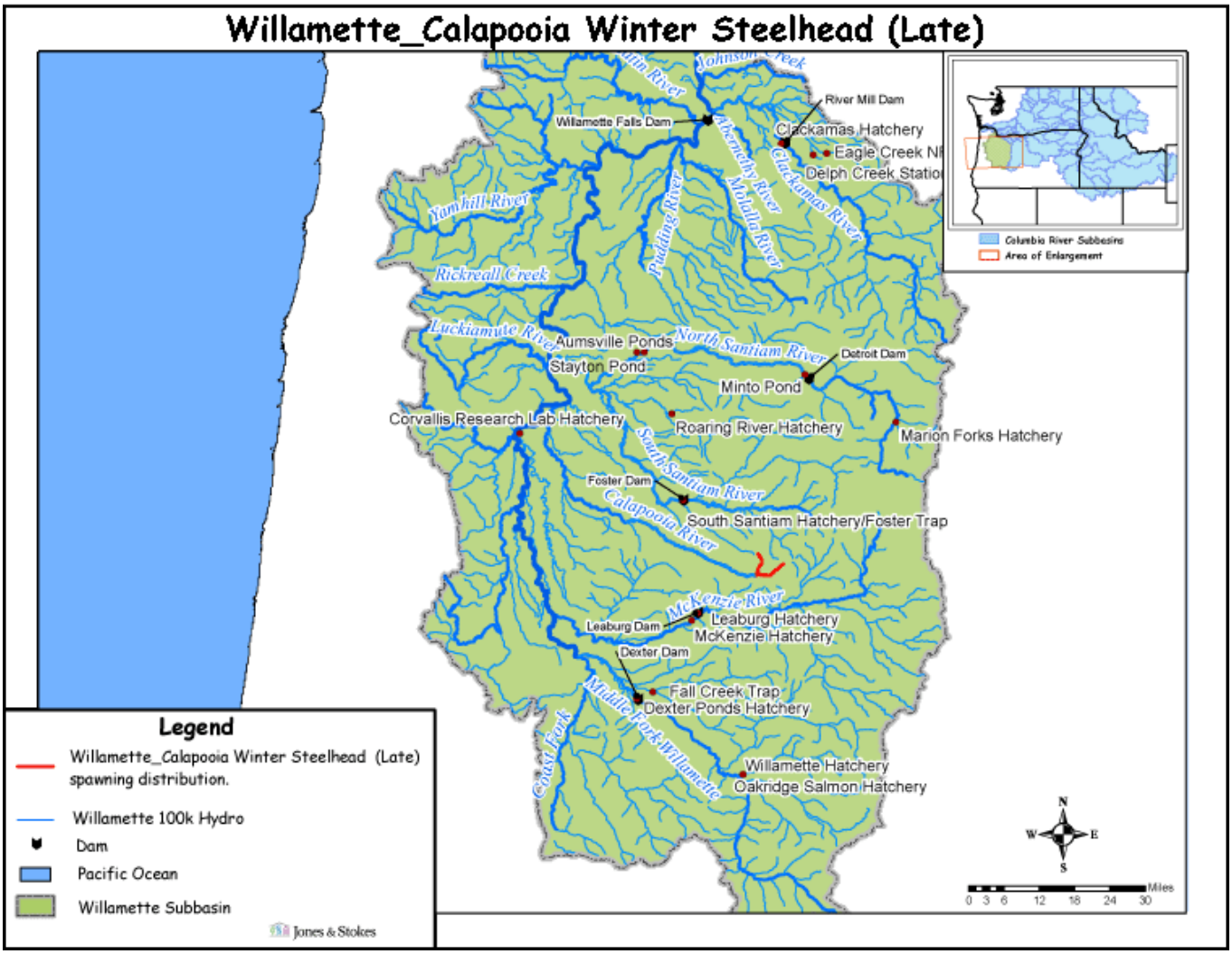
Hatchery Scientific Review Group
Review and Recommendations

Willamette – Calapooia Winter Steelhead (Late)
Population and Related Hatchery Programs

January 31, 2009



1 Calapooia Winter Steelhead (Late)

This population represents native late-run winter steelhead spawning within the Calapooia River subbasin. The Upper Willamette Steelhead ESU consists of four populations: Molalla, North Santiam, South Santiam, and Calapooia. It is generally agreed that steelhead did not historically emigrate farther upstream than the Calapooia River (Fulton 1970). The Westside Tributaries represent an area intermittently used by steelhead, which may be important for ESU recovery, but is not considered to have historically been an independent population (Myers et al. 2006; McElhany et al. 2007 review draft). Although steelhead in this ESU are depressed from historical levels, all of the historical populations remain extant with moderate numbers of wild steelhead produced each year. However these populations have been adversely affected by the alteration and loss of spawning and rearing habitat associated with hydropower development.

Steelhead returning to the Calapooia subbasin do not have the access to potential production areas that they had historically (McElhany et al 2007 review draft). In addition, habitat degradation has substantially reduced the spatial distribution of suitable steelhead habitat within the accessible area. It should be noted that some of the blocked habitat may not have been historically used by winter steelhead. A time series of redds-per-mile data from the Calapooia shows a declining trend from 1980 to 2001 (WCS BRT 2003). Based on indices of wild steelhead spawner abundance for the five Upper Willamette winter steelhead subpopulations, Chilcote (1998) determined that the Calapooia subbasin meets the criteria for endangered classification (more than a 20 percent chance of extinction in 20 years) (Subbasin Plan).

Willis et al. (1960) reported that both live and dead steelhead were observed in the Calapooia River on May 12, 1958, as were 427 redds. In 1993, spawner density estimates for the Calapooia River were at a record low of 1.8 spawners per mile (Chilcote 1997). The average escapement of late-run winter steelhead to the Calapooia River reached critically low levels during the mid-1990s (1993-1997) with returns of only 61 fish (ODFW 1998). In the last four years escapement has reached several hundred fish (427) (Goodson 2005; McElhany et al 2007 review draft).

Currently, the Calapooia late winter steelhead population is small, with a long-term (1980-2005) geometric mean natural-origin spawner of 458 and a recent (1990-2005) geometric mean of 339 (McElhany et al 2007 review draft). Over the recent period, the geometric mean recruits-per-spawner was 2.163, with a hatchery fraction of zero. The pre-harvest viability curve analyses suggest that the population is probably viable if harvest levels remain low (McElhany et al 2007 review draft). The escapement viability curves suggest that the harvest pattern observed over the course of the time series is likely sustainable; the harvest rate over the recent period was 0.099.

2 Current Conditions

2.1 Current Population Status and Goals

This section describes the current population, status, and goals for the natural population.

- ESA Status: Calapooia Winter Steelhead (late) are part of the Upper Willamette River Steelhead ESU, which was listed as Threatened under the ESA on March 25, 1999; the threatened status was reaffirmed January 5, 2006.
- Population Description: The Calapooia Winter Steelhead (late) population has not been assigned a designation by the TRT. This population was given a Contributing designation for the HSRG review.

- Recovery Goal for Abundance: Unknown
- Productivity Improvement Expectation: Unknown
- Habitat Productivity and Capacity (e.g., from EDT): Productivity: 4.05, Capacity: 661

2.2 Current Hatchery Programs Affecting this Population

There are currently no hatchery steelhead programs in the Calapooia River subbasin. Chilcote (1997) estimates that hatchery fish (predominately strays from other Upper Willamette River DIPs) constitute less than 5% of escapement (McElhany et al 2007 review draft).

Since Willamette Falls was laddered in the early 1900s, hatchery stocks of summer and early-run winter steelhead have also been introduced into the Upper Willamette River from other ESUs. In 1982, it was estimated that 15% of the late-run winter steelhead ascending Willamette Falls were of hatchery origin (Howell et a. 1985). All of the hatchery programs for steelhead were discontinued in the late 1990s, except for summer steelhead programs in the North Santiam, South Santiam, McKenzie, and Middle Fork Willamette rivers. Winter steelhead are not native to the McKenzie or the Middle Fork Willamette rivers. Currently the only strays into the Calapooia River are likely from summer steelhead programs in the McKenzie and Santiam rivers. The incidence of stray hatchery fish, summer-run steelhead, or winter-run steelhead from other basins in the Upper Willamette River is thought to be low, although given the low escapement, even a few fish could have a significant influence on the population (McElhany et al 2007 review draft).

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 74 fish.

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 PNI (proportionate natural influence) 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 3.5 to 4.2. Average abundance of natural-origin spawners (NOS) would increase from approximately 560 fish to approximately 620 fish. Harvest contribution of the natural and hatchery populations would go from approximately 17 fish to approximately 19 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 population appears to meet the standards for a Contributing designation. There is no hatchery program in this subbasin.

Recommendations

Periodically monitor the contribution of hatchery strays to the natural population.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Calapooia 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.objectives.

Alternative	Type and Purpose	Prog Size (/1000)	HOR Recapture	Additional Weir Efficiency	Effective pHOS	PNI	NOS Esc	Adj Prod	Harvest	Hatchery Surplus
Current	None None	-	0%	0%	2%	0.00	556	3.5	17	-
No Hatchery	None None	-	0%	0%	0%	1.00	621	4.2	19	-
HSRG Solution	None None	-	0%	0%	2%	0.00	568	3.6	17	-
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	2%	0.00	655	4.1	20	-