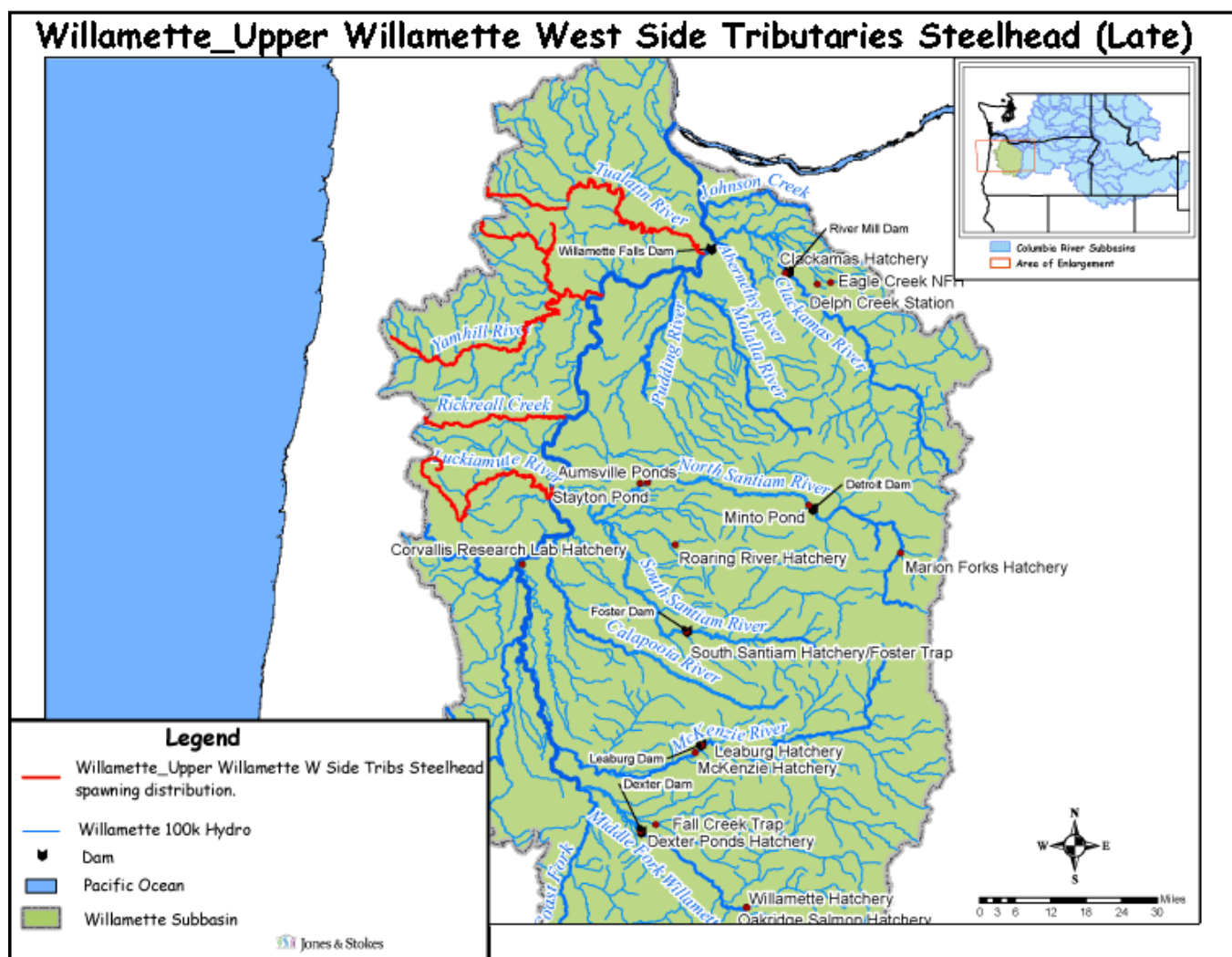


# Hatchery Scientific Review Group Review and Recommendations

## Willamette – Upper Willamette River West Side Tributaries Winter Steelhead (Late) Population and Related Hatchery Programs

January 31, 2009



# 1 Upper Willamette Westside Tributaries Winter Steelhead (Late)

This population includes late winter steelhead naturally spawning in westside tributaries of the Willamette River draining the Coast Range, including the Tualatin, Yamhill, Rickreall and Luckiamute rivers. The westside tributaries are 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). There is considerable debate as to whether the existing fish are native or derived from introduced stocks (Myers et al. 2003). Others have suggested that winter steelhead are only native to the eastside tributaries draining the Cascade Range (McElhany et al. 2007 review draft).

Naturally spawning winter steelhead are currently found in several westside tributaries of the Willamette River (Tualatin [Gales Creek], the Luckiamute, Rickreall Creek, and the Yamhill River). Surveys in 1940 reported anecdotal information of steelhead spawning in Gales Creek, a tributary to the Tualatin River (Parkhurst et al. 1950). Numerous introductions of early-run winter steelhead (Big Creek Hatchery stock) and late-run (North Santiam stock) winter steelhead have been made into the Tualatin River; this makes it difficult to determine whether the existing fish represent native or introduced lineages (Subbasin Plan).

With the exception of Gales Creek in the Tualatin subbasin, Parkhurst et al. (1950) did not report the presence of any salmon or steelhead in the westside tributaries. ODFW observations suggest that late-run winter steelhead may have recently colonized the Yamhill River (NMFS 1999).

Recent genetic analysis of presumptive steelhead from the westside tributaries indicates that fish from the Yamhill River and Rickreall Creek were most similar to hatchery populations from the lower Columbia River. Fish sampled from the Luckiamute River had no clear affinity with any other steelhead populations and may be representative of an isolated resident *O. mykiss* population (Subbasin Plan).

## 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:** Willamette Westside Tributaries Winter Steelhead (late) are part of the Upper Willamette River Steelhead DPS, which was listed as Threatened under the ESA on March 25, 1999; the threatened status was reaffirmed January 5, 2006.
- **Population Description:** The Willamette Westside Tributaries 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: 2.0; Capacity: 250 assigned for this review.

## 2.2 Current Hatchery Programs Affecting this Population

There are no steelhead hatchery programs in the Upper Willamette Westside Tributaries, including the Tualatin, Yamhill, Rickreall and Luckiamute rivers.

Since Willamette Falls was laddered in the early 1900s, hatchery stocks of summer and early-run winter steelhead have 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 al. 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 River in the middle fork of the Willamette River. Currently the only strays into the Upper Willamette Westside Tributaries are likely from summer steelhead programs in the McKenzie and Santiam rivers.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 10 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 1.2 to 1.8. Average abundance of natural-origin spawners (NOS) would

increase from approximately 40 fish to approximately 100 fish. Harvest contribution of the natural and hatchery populations would go from approximately 5 fish to approximately 13 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**

There is no hatchery program in this subbasin and no information about the natural production of steelhead.

**Recommendations**

The HSRG has no recommendations for this population.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Westside Willamette Tributary 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	None None	-	0%	0%	5%	0.00	42	1.2	5	0
No Hatchery	None None	-	0%	0%	0%	1.00	104	1.8	13	-
HSRG Solution	None None	-	0%	0%	3%	0.00	54	1.3	7	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	2%	0.00	101	1.7	13	0