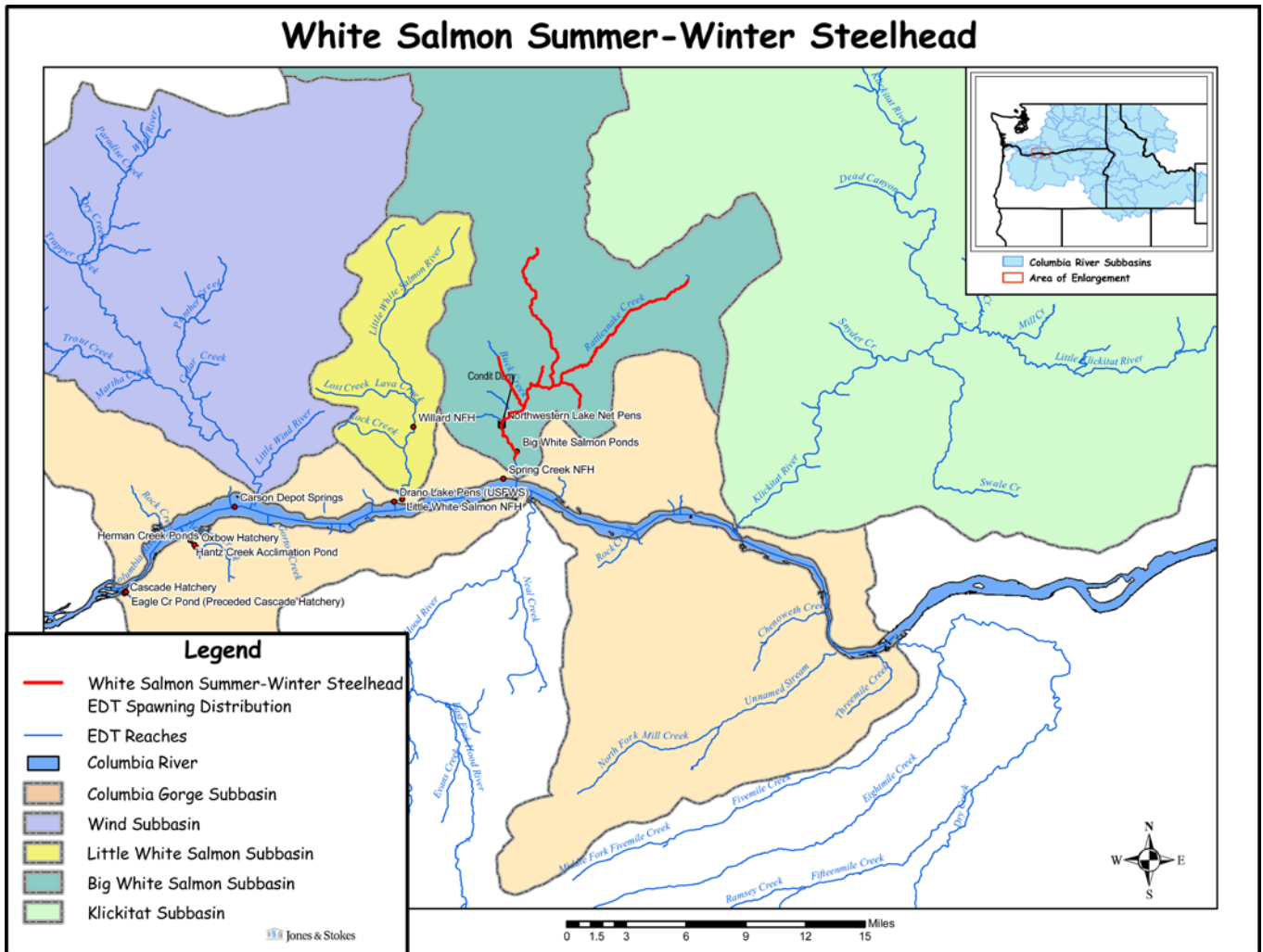


Hatchery Scientific Review Group Review and Recommendations

White Salmon Summer Steelhead Population and Related Hatchery Programs

January 31, 2009



1 White Salmon Summer Steelhead

Steelhead trout are native to the White Salmon River (WDF et al. 1993) and their historical distribution extended from the mouth up to RM 16 in the mainstem, and Buck, Spring, Indian, and Rattlesnake creeks. The current distribution is limited to the area below Condit Dam (RM 3.4).

Current steelhead abundance at equilibrium in the White Salmon subbasin is expected to be 20 steelhead (in the absence of harvest). EDT modeling indicates wild steelhead abundance in the absence of harvest has declined from 1,137 spawners to less than 20 spawners.

Two races of steelhead exist, winter and summer. Winter steelhead enter rivers from November to May and are usually near final stages of maturity upon entry. Summer steelhead return as immature fish between April and October, although some summer steelhead hold over in the Columbia River throughout the year and enter tributaries as they approach spawning. It is likely that both races historically were present in the White Salmon subbasin.

Wild steelhead from both races spawn from February through June, with peak spawning in April. Hatchery stocks used in the White Salmon subbasin typically spawn from December through February, with peak activity in January. Steelhead typically spend two or three years as juveniles in freshwater before outmigrating to the ocean. Outmigration takes place during the spring and typically peaks in early May.

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:** The White Salmon steelhead are considered to be part of the Middle Columbia GDU, which includes 101 populations of Washington steelhead between the White Salmon and Walla Walla rivers (Leider et al. 1995). The NMFS has included this population in the Middle Columbia River Evolutionary Significant Unit (ESU), which was listed as Threatened under the ESA in 1999. The threatened status was reaffirmed in 2006.
- **Population Description:** The Lower Columbia Salmon Recovery and Subbasin Plan indicates that a natural summer steelhead population is not present in the White Salmon River (LCSR&SP 2004). The status of steelhead in the White Salmon River is listed as depressed due to the lack of access to historical spawning areas (WDF et al. 1993).
- **Recovery Goal for Abundance:** Unknown
- **Productivity Improvement Expectation:** Unknown
- **Habitat Productivity and Capacity (e.g., from EDT):** Productivity: 3.9, Capacity: 25 (with no passage at Condit Dam); Productivity: 2.9, Capacity: 406 (with passage at Condit Dam).

2.2 Current Hatchery Programs Affecting this Population

Two hatchery programs affect this population: a segregated summer steelhead plant of about 20,000 smolts and a segregated winter steelhead plant of about 20,000 smolts; both coming from

Skamania Hatchery as direct outplants. No steelhead hatchery programs are currently operating in this subbasin.

- Hatchery strays from in-basin integrated hatchery program: N/A
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 566

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 1.7 to 3.4. Average abundance of natural-origin spawners (NOS) would increase from 3 to 17. Harvest contribution of the natural and hatchery populations would go from 302 to 3.

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

After removal of Condit Dam, it may be possible for the steelhead population to be managed consistent with the standards for a Contributing population. Two hatchery programs affect this population: a segregated summer steelhead plant of about 20,000 smolts and a segregated winter steelhead plant of about 20,000 smolts; both coming from Skamania Hatchery as direct outplants. We also note that most of the recreational harvest of summer steelhead in the Big White Salmon River appears to be provided by hatchery fish from other out-of-basin hatchery programs (dip-ins) as the harvest has averaged 3,900 fish per year recently. The contribution from the current summer steelhead releases into this river appears to be small relative to the dip-ins. In addition, releases of winter steelhead into the Big White Salmon appear to provide very little harvest benefit (less than 100 fish).

A genetic legacy for the steelhead population may still be contained in the existing resident rainbow trout population upstream of Condit Dam (Phelps 1990). This should be taken into consideration in reestablishing a natural population after Condit Dam is removed (scheduled for 2008-2009).

Recommendations

Given that conservation is a goal after removal of Condit Dam and the limited harvest benefits from the in-basin releases, managers might consider discontinuing the segregated programs for both summer and winter steelhead to promote reestablishment of naturally-spawning populations of steelhead from resident populations.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for White Salmon River Summer 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	Summer /Winter None None	-	0%	0%	97%	0.00	3	1.7	0	0
	Winter Seg Harv	19.8	0%						141	1
	Summer Seg Harv	20.1	0%						161	0
No Hatchery	Summer /Winter None None	-	0%	0%	0%	1.00	17	3.4	3	-
HSRG Solution	Summer /Winter None None	-	0%	0%	72%	0.00	3	1.7	0	0
	Winter Seg Harv	-	0%						-	-
	Summer Seg Harv	-	0%						-	-
HSRG Solution w/ Improved Habitat	Summer /Winter None None	-	0%	0%	68%	0.00	3	1.9	1	0
	Winter Seg Harv	-	0%						-	-
	Summer Seg Harv	-	0%						-	-