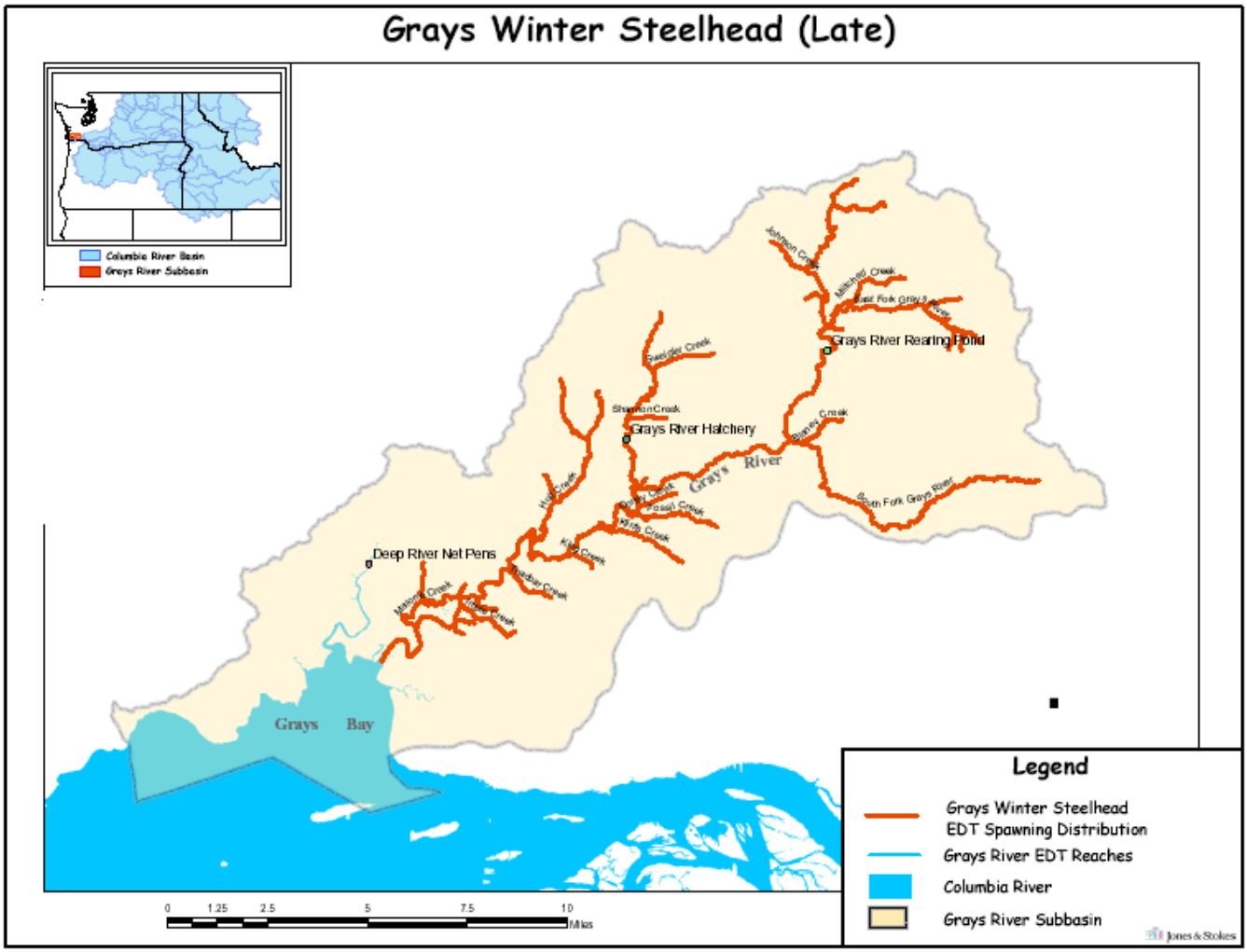
Hatchery Scientific Review Group
Review and Recommendations

Grays River Winter Steelhead
Population and Related Hatchery Programs

January 31, 2009



Grays River Winter Steelhead

1 Grays River Winter Steelhead

Grays winter steelhead were identified as a stock based on their distinct spawning distribution. Spawning takes place throughout the mainstem Grays River and in the East, West and South forks of the Grays. Spawning generally occurs from March through early June. Genetic sampling was conducted in 1994 and 1995; 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). An escapement goal of 1,486 fish has been established for this stock (SaSSI 2002).

2 Current Conditions

2.1 Current Population Status and Goals

The Grays River native winter steelhead population is documented in the LCRSRP. The WDFW SaSi 2002 report also indicates a native population with wild production. The 2002 report rated this stock status as "depressed" due to chronically low spawner escapements. Recently however, an increase in the number of wild spawners has been documented (2000 forward).

- ESA Status: This population is not listed.
- Population Description: Today a small but persistent run of wild winter steelhead returns to the Grays River. The precise distribution of the stock is not known, but the fish do penetrate high into the watershed and it is estimated that the escapement is between 400 and 600 fish annually (NPCC 2002).
- Current Viability Rating: Low, designated as a Primary population in the LCRSRP. A goal of High viability has been identified in recovery planning documents.
- Recovery Goal for Abundance: A viability goal of 600 adults was identified in the LCRSRP; an interim goal of 600 adults was also identified. The level of current escapement has averaged 727 adults (1991-2003 data). Productivity Improvement Expectation: Unknown
- Habitat Productivity and Capacity (from EDT): Productivity 4.89; Capacity 1,126

2.2 Current Hatchery Programs Affecting this Population

Winter steelhead hatchery populations in the region that affect this population (e.g., through straying) are the Grays River Hatchery early winter steelhead program via the Elochoman Hatchery (Chambers Creek origin). Hatchery winter steelhead in the Grays River come from broodstock collected at the Elochoman Hatchery. Fry are transferred to Grays River for rearing and release (40,000 smolt program).

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program – from AHA summary –N/A
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs – from AHA summary--57

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 4.4 to 4.6. Average abundance of natural-origin spawners (NOS) would increase from 908 to 918. Harvest contribution of the natural and hatchery populations would go from 241 to 63.

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 unlisted population meets Primary standards and HSRG recommendations for pHOS. The system supports a small fishery and is meeting viability goals.

While the current program (40,000 smolts that come from Elochoman as fingerlings) is within HSRG guidelines for segregated programs, the HSRG notes that a unique opportunity exists to establish a "Wild Steelhead Management Zone" within the Grays River Basin.

Recommendations:

The existing program meets the standards for a Primary population.

The HSRG suggests that managers consider the ecological effect on this population. While these outplants do not appear to be having a genetic effect, considering Kostow's data for summer steelhead, the HSRG urges caution (Kostow 2003, 2004, 2006).

Consideration should be given to converting this segregated program to an integrated program. A larger integrated program then could be implemented that still meets management parameters for a Primary population and would provide a harvest.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Grays River 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	-	50%	0%	1%	0.00	908	4.4	62	0
	Seg Harv	40.0	50%						179	56
No Hatchery	None None	-	0%	0%	0%	1.00	918	4.6	63	-
HSRG Solution	None None	-	0%	0%	1%	0.00	884	4.2	60	0
	Seg Harv	40.0	0%						179	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	1,005	4.7	69	0
	Seg Harv	40.0	0%						179	0