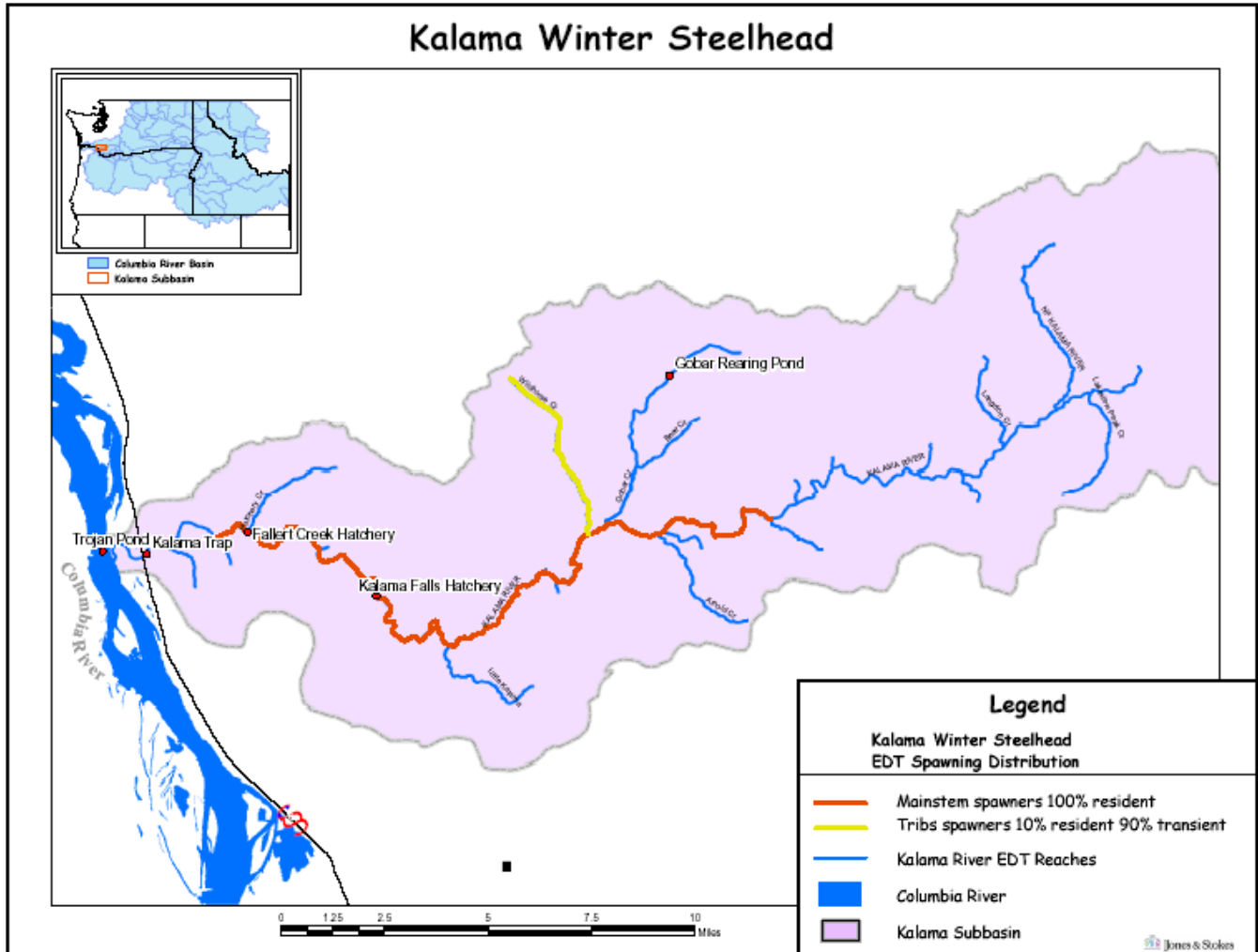


Hatchery Scientific Review Group Review and Recommendations

Kalama River Winter Steelhead Population and Related Hatchery Programs

January 31, 2009



1 Kalama River Winter Steelhead

Kalama winter steelhead were identified as a stock based on their distinct spawning distribution and later run timing. Stock status was rated Healthy in 2002 because this stock has maintained relatively stable escapement estimates within the normal range of variation. A stock escapement goal of 1,000 fish has been established.

Most spawning takes place in the mainstem Kalama River and in tributaries such as Gobar, Elk, and Fossil creeks. Spawning generally occurs from early January through early June.

Genetic sampling was conducted in 1994, however, the collection (juveniles) may have contained both summer and winter steelhead, so comparisons of this collection with others are not very informative (Myers et al. 2002).

2 Current Conditions

2.1 Current Population Status and Goals

The Kalama River supports native winter-run and summer-run steelhead populations. Both the naturally-spawning winter-run and summer-run steelhead population are considered Primary populations for ESA Recovery of the Lower Columbia Steelhead DPS.

- **ESA Status:** This population is listed as threatened under the ESA and is part of the Lower Columbia River Steelhead DPS. This ESU includes all natural-origin steelhead between the Cowlitz and Wind rivers, inclusively, on the Washington side of the Columbia, as well as natural-origin steelhead in the Clackamas, Sandy, and Hood rivers, inclusively, on the Oregon side.
- **Population Description:** This is a Primary population.
- **Current Viability Rating:** Medium +
- **Recovery Goal for Abundance:** High +, with a goal of 650 natural origin recruits (a 46% improvement)
- **Productivity Improvement Expectation:** 5.8 maximum recruits/spawner (45% improvement)
- **Habitat Productivity and Capacity (from EDT):** Productivity 4.0; Capacity 445
Note that in the Lower Columbia River Recovery Plan, the capacity was defined as 541 adults.

2.2 Current Hatchery Programs Affecting this Population

WDFW currently conducts two hatchery programs for winter-run steelhead on the Kalama River: (1) an “early-run” segregated-harvest program using a stock of Chambers Creek origin and (2) an integrated late-run research program that is evaluating the feasibility of an endemic broodstock program derived from natural-origin adults trapped in the Kalama River. Each program releases approximately 45,000 yearling smolts (90,000 yearling smolts total). In addition, there are two hatchery summer steelhead programs, one integrated and one segregated (30,000 smolts each).

Adults for both programs are trapped at the Kalama Falls Hatchery. Approximately 40 early-run hatchery-origin adults are required each year to produce 45,000 smolts for the segregated early-run broodstock program. Approximately 48 late-run natural-origin adults are required each year to produce 45,000 smolts for the endemic integrated program. Fertilized eggs for both programs are incubated, hatched, and reared at the Fallert Creek Hatchery on the lower Kalama River. Pre-

smolts for both programs are transferred to Gobar Pond (upstream of Kalama Falls Hatchery) for acclimation and release.

The estimated mean terminal harvest for *early* winter-run hatchery steelhead in the Kalama River is approximately 350 adults per year. The estimated mean terminal harvest for *late endemic* winter-run hatchery steelhead in the Kalama River is approximately 480 adults per year.

Estimated mean R/S for *early* winter-run hatchery produced fish \approx 13.5 recruits/spawner.

Estimated R/S for *late endemic* winter-run hatchery produced fish \approx 15.3 recruits/spawner.

- PNI: 0.94
- pHOS: 7%
- Estimated Productivity with harvest and fitness factors adjusted from AHA: 2.71
- Projected Average Natural-origin Recruit Escapement: 382 adults
- Hatchery strays from in-basin integrated hatchery program: 30 fish
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 30 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 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 at 2.7. Average abundance of natural-origin spawners (NOS) would increase from 382 to 458. Harvest contribution of the natural and hatchery populations would go from 920 to 44.

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 is designated a Primary population. Only natural-origin adults are passed upstream. There is a 45,000 smolt segregated winter steelhead program and a 45,000 smolt integrated winter steelhead program. In addition there is a segregated summer steelhead program of 30,000 smolts and an integrated summer steelhead program of 30,000 smolts. All hatchery-origin adults are captured and recycled through the lower river for additional harvest opportunity.

Recommendations

It might be preferable to manage this population as an integrated population. Managers should consider this population in context of all Primary winter steelhead populations in the ESU. Based on the information provided, the HSRG recommends eliminating the segregated program and increasing the integrated program to approximately a 100,000 smolt release. This will reduce the number of populations to manage in the watershed and reduce the risk to this Primary steelhead population while still providing harvest.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Kalama 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 | Int Harv | 45.2 | 90% | 0% | 7% | 0.94 | 382 | 2.7 | 548 | 282 |
| | Seg Harv | 45.8 | 90% | | | | | | 372 | 168 |
| No Hatchery | None None | - | 0% | 0% | 0% | 1.00 | 458 | 2.7 | 44 | - |
| HSRG Solution | Int Harv | 99.7 | 90% | 0% | 13% | 0.71 | 362 | 2.4 | 1,155 | 551 |
| | Seg Harv | - | 90% | | | | | | - | - |
| HSRG Solution w/ Improved Habitat | Int Harv | 99.7 | 90% | 0% | 11% | 0.74 | 435 | 2.7 | 1,162 | 551 |
| | Seg Harv | - | 90% | | | | | | - | - |