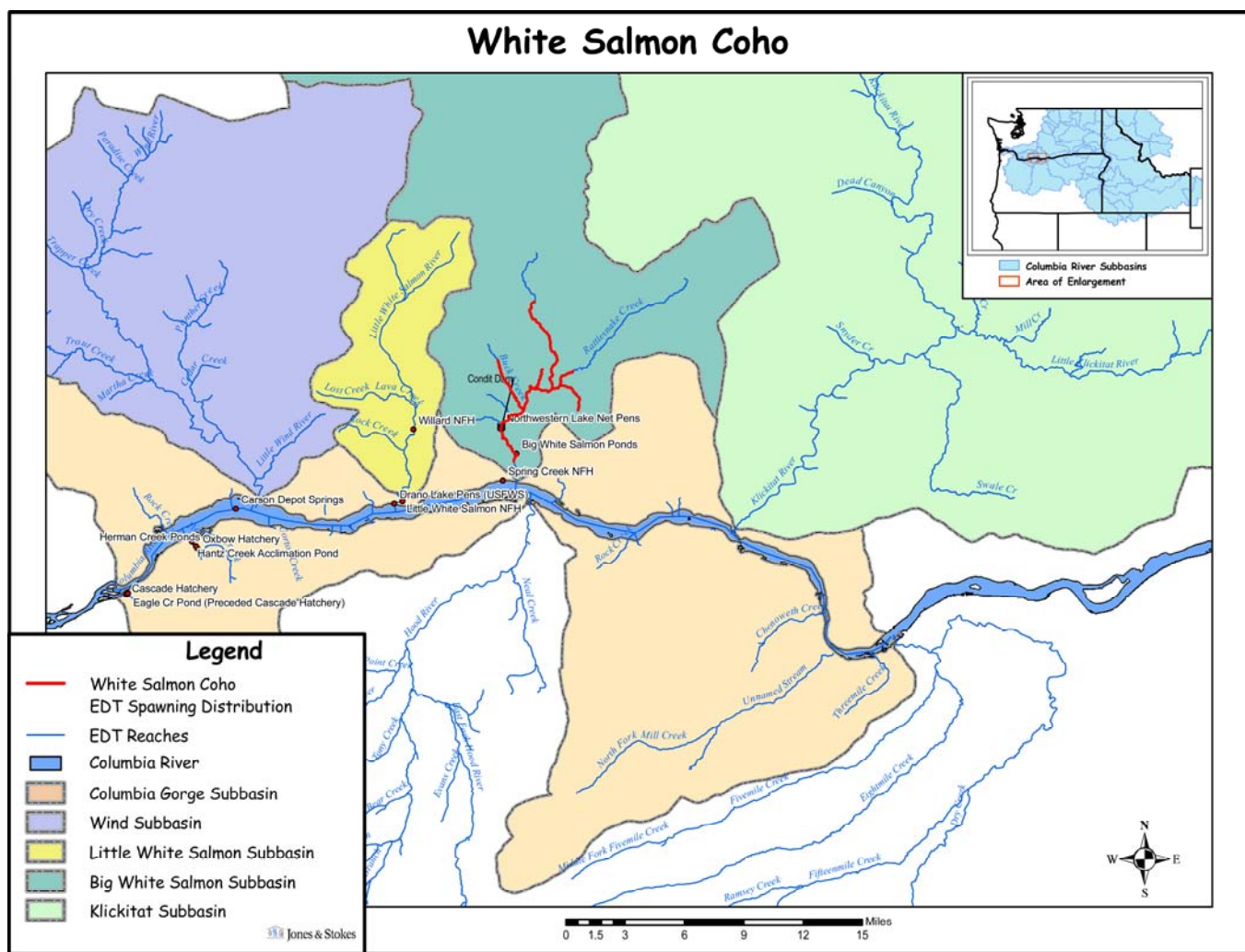


# Hatchery Scientific Review Group Review and Recommendations

## White Salmon River Coho Population and Related Hatchery Programs

January 31, 2009



## 1 White Salmon Coho (Early- Type S)

Coho salmon are native to the White Salmon River (WDF et al. 1993) and their historical distribution extended from the mouth up to RM 14 in the mainstem, and included Buck, Spring, Indian, and Rattlesnake creeks. The distribution has been limited to the area below Condit Dam (RM 3.4) since it was constructed in 1913.

There may be some coho production occurring in the lower one mile of stream below Condit Dam; however, population monitoring does not occur. Based on EDT modeling, the current abundance at equilibrium is expected to be 470 coho in the absence of harvest. EDT modeling indicates wild steelhead abundance in the absence of harvest has declined from 1,278 spawners to less than 470 spawners (Subbasin Plan 2004).

Adults enter the Columbia River from August through December with wild populations peaking in October and November. Spawning occurs from October through January, peaking in November. Adult coho are 3-year-olds and jacks are age 2. Eggs remain in the gravel until emergence, which occurs from February to April, depending on water temperatures. Shortly after fry colonization, juveniles continue rearing until October. Outmigration occurs for yearlings during the following spring, peaking in May.

It is likely that the genetic diversity and fitness of wild coho salmon in this basin has been reduced due to low carrying capacity below Condit Dam, hatchery introgression from releases to meet mitigation locations specified in US vs. Oregon, and decreased spawners due to in and out-of-subbasin fisheries.

## 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:** White Salmon River coho are part of the Lower Columbia River Coho ESU, which was listed as Threatened under the ESA in 2005.
- **Population Description:** The White Salmon coho population is designated as a Contributing population in the Lower Columbia Salmon Recovery and Subbasin Plan (LCSR&SP 2004). The LCSR&SP describes current viability as Very Low with a viability goal of Low.
- **Recovery Goal for Abundance:** 150
- **Productivity Improvement Expectation:** Unknown
- **Habitat Productivity and Capacity (e.g., from EDT):** Productivity: 3.7; Capacity: 692 (with no passage at Condit Dam); Productivity: 2.1; Capacity: 2,069 (with passage at Condit Dam).

### 2.2 Current Hatchery Programs Affecting this Population

There are no coho hatchery programs in this watershed.

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program: N/A

- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 88 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 increase from 0.9 to 2.9. Average abundance of natural-origin spawners (NOS) would increase from 107 to 377. Harvest contribution of the natural and hatchery populations would go from 40 to 142.

#### 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 and reestablishment of a natural coho run, it may be possible to manage the population consistent with the standards for a Primary population. If managed for conservation, this population could make a significant contribution to recovery of the Lower Columbia coho ESU.

**Recommendations**

Once a natural population is established, the HSRG recommends that managers monitor for the presence of out-of-basin strays.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for White Salmon River Coho. 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%                         | 40%            | 0.00 | 107     | 0.9      | 40      | 0                |
|                                   |                  |                   |               |                            |                |      |         |          |         |                  |
| No Hatchery                       | None None        | -                 | 0%            | 0%                         | 0%             | 1.00 | 377     | 2.9      | 142     | -                |
| HSRG Solution                     | None None        | -                 | 0%            | 0%                         | 6%             | 0.00 | 217     | 1.8      | 82      | 0                |
|                                   |                  |                   |               |                            |                |      |         |          |         |                  |
| HSRG Solution w/ Improved Habitat | None None        | -                 | 0%            | 0%                         | 4%             | 0.00 | 307     | 2.3      | 116     | 0                |
|                                   |                  |                   |               |                            |                |      |         |          |         |                  |