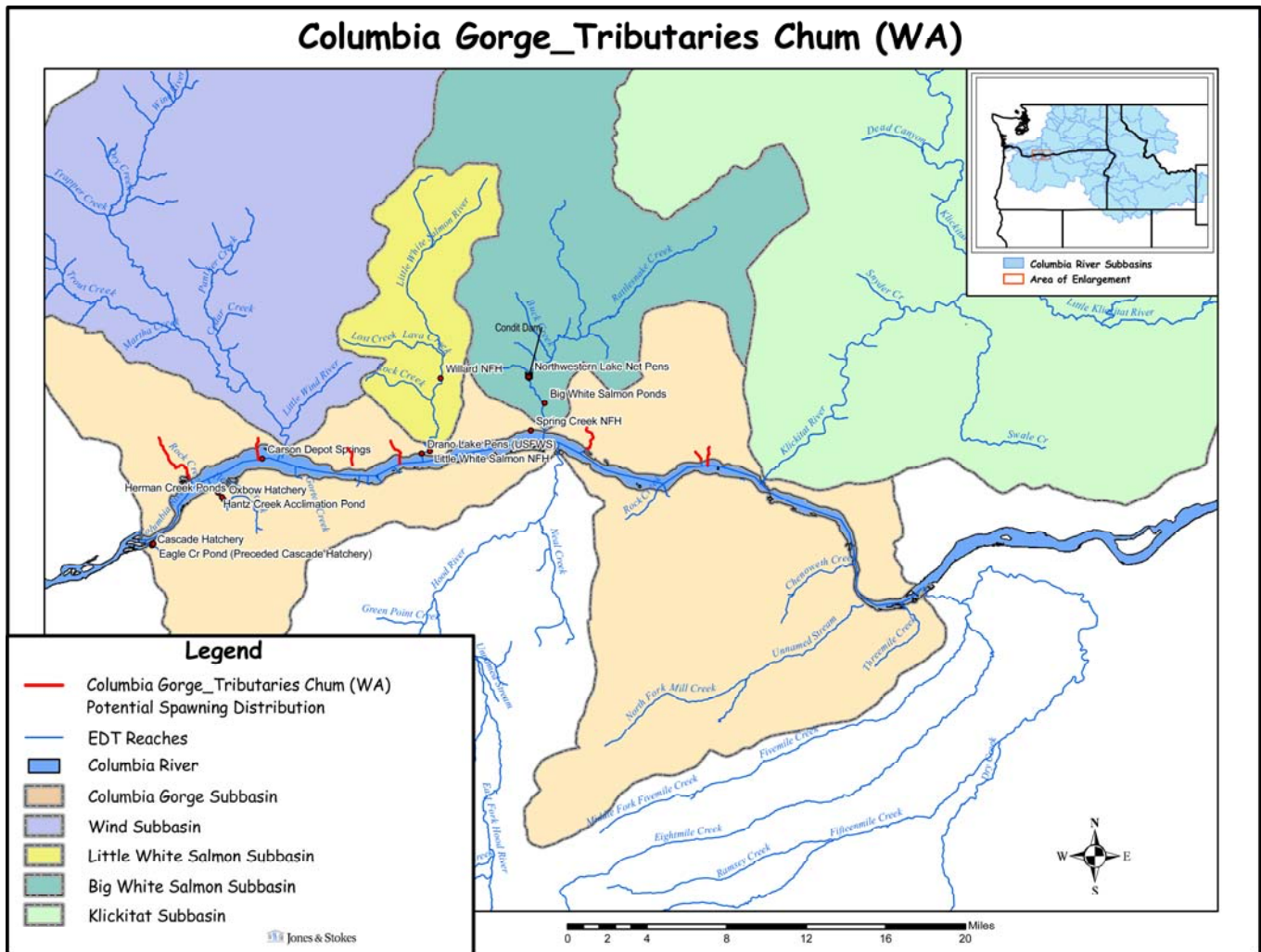


# Hatchery Scientific Review Group Review and Recommendations

## Columbia Gorge Tributaries Chum (Upper Gorge) Population and Related Hatchery Programs

January 31, 2009



# 1 Columbia Gorge Tributaries Chum (Upper Gorge)

Historically, chum salmon were abundant in lower portions of the Columbia River and supported annual harvests of hundreds of thousands of fish. The majority of the historic chum habitat is inundated by the Bonneville Reservoir and passage of adult chum over Bonneville Dam may be problematic, although a few chum are observed crossing Bonneville Dam each year. It is unknown if these are adults returning to natural spawning areas upstream or strays from hatchery or natural production below Bonneville Dam.

Currently, the relative abundance of chum salmon is likely less than one percent of historical levels. Spawning is known to occur in only three streams (Hardy Creek, Hamilton Creek, and Grays River), none of which occur within the Upper Gorge Chum Population.

Presently, there are no recreational or commercial fisheries for chum salmon in the Columbia River, although some fish are incidentally taken in the gill-net fisheries for coho and Chinook salmon.

Chum emerge in mid-March and spend minimal time in freshwater. Chum migration is believed to be complete by early spring prior to late April-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:** Upper Columbia Gorge chum are within the lower Columbia River Evolutionary Significant Unit (ESU) and are federally listed as Threatened, effective May 24, 1999.
- **Population Description:** This population is part of the Upper Gorge Chum Population, which 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 Medium.
- **Recovery Goal for Abundance:** 600
- **Productivity Improvement Expectation:** Unknown
- **Habitat Productivity and Capacity (e.g., from EDT):** Unknown. For modeling purposes, the following was assumed: Productivity: 1.5; Capacity: 100.

### 2.2 Current Hatchery Programs Affecting this Population

Straying of hatchery-produced chum to this population is thought to be negligible.

- **Hatchery strays from in-basin integrated hatchery program –** None
- **Hatchery strays from in-basin segregated and out-of-basin hatchery programs –** None

## 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 unchanged at 1.5 returns per spawner. Average abundance of natural-origin spawners (NOS) remained unchanged at 33 adults. Incidental harvest of the natural and hatchery populations remained unchanged at 1 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). HSRG Recommendations.

**Observations**

Few chum move upstream of Bonneville Dam. Information provided to the HSRG suggests that there is chum habitat potential in the lower portion of tributaries of the Columbia Gorge tributaries.

The HSRG understands that several hundred chum salmon pass upstream of Bonneville Dam. These fish may be a broodstock source for reintroduction of chum in the Columbia Gorge tributaries.

**Recommendations**

Since reintroduction of chum upstream of Bonneville has been established as a priority, a chum hatchery conservation program should be initiated as part of an overall chum salmon recovery strategy for the Columbia River Chum ESU. Potential candidate locations for chum reintroduction would be based on habitat surveys on both sides of the Columbia River.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Upper Columbia Gorge Tributaries Chum. 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%	0%	1.00	33	1.5	1	-
No Hatchery	None None	-	0%	0%	0%	1.00	33	1.5	1	-
HSRG Solution	None None	-	0%	0%	0%	1.00	33	1.5	1	-
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	0%	1.00	44	1.6	1	-