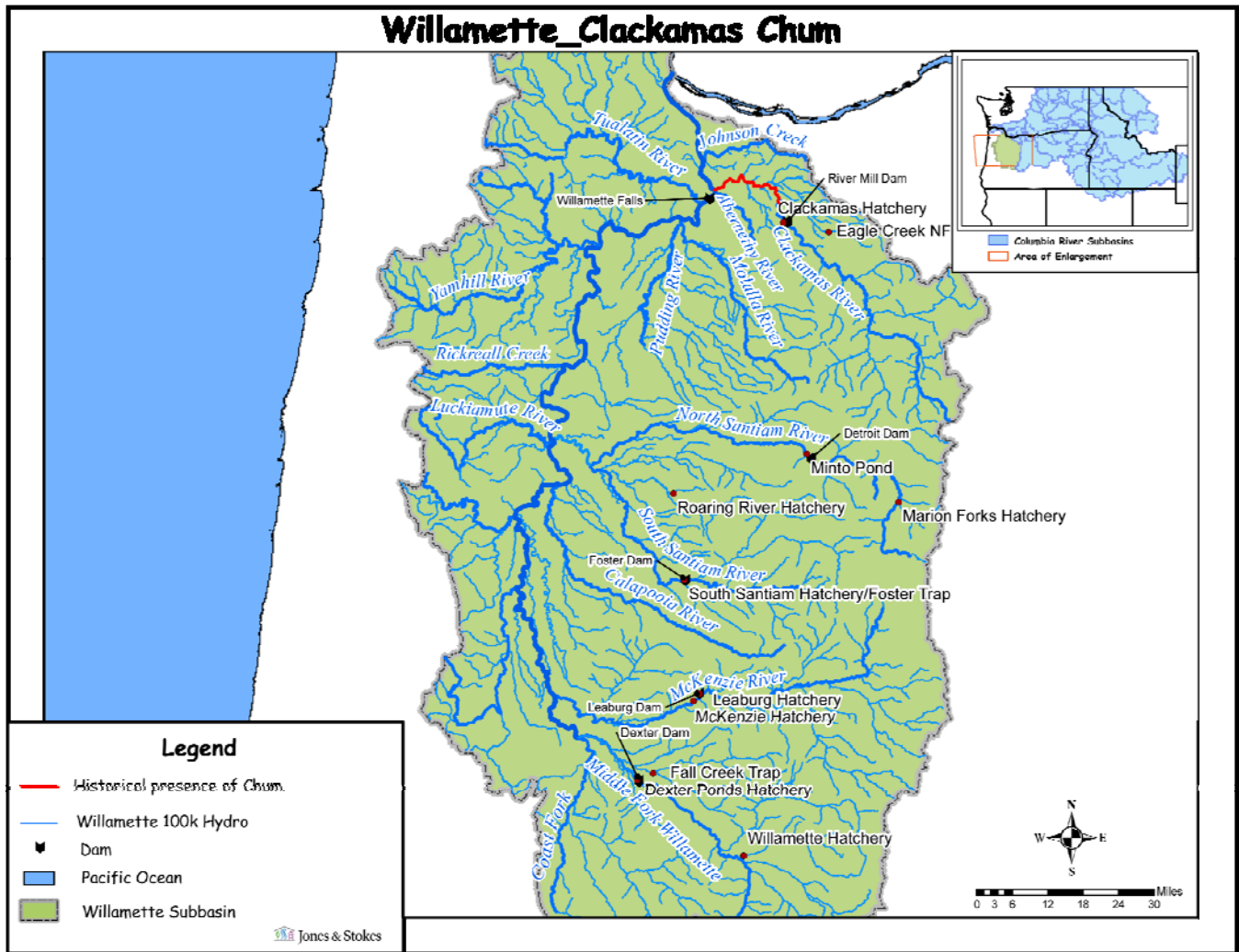


# Hatchery Scientific Review Group Review and Recommendations

## Willamette - Clackamas Chum Salmon Population and Related Hatchery Programs

January 31, 2009



# 1 Clackamas Chum Salmon

The Clackamas chum population is part of the Columbia River Chum ESU, which includes all naturally-spawning populations of chum salmon in the Columbia River and its tributaries in Washington and Oregon. Historically, over a million chum returned to the Columbia River in some years (McElhany 2005). Recently only a few hundred to a few thousand chum have returned each year to the Columbia, to a very restricted subset of the historical range in the Washington side of the Columbia: Grays River, immediately below Bonneville Dam (Hardy and Hamilton creeks) and, to a lesser extent, under the I-205 bridge near Vancouver (McElhany 2005).

Preliminary WLC-TRT analyses suggest that 14 of the 16 historical populations (88%) are extinct or nearly so. The two extant populations (Grays River and Lower Columbia River Tributaries) have been at low abundance for the last 50 years in the range where stochastic processes could lead to extinction. The abundance of these two populations has recently increased substantially and spawning population has recently been discovered in the Washougal River.

All of the eight historical Oregon side populations, including the Clackamas, are considered extirpated or nearly so. By 1944, chum salmon were not found during biological surveys of the Clackamas River (Dimick and Merryfield 1945). In 2000, ODFW conducted surveys at 30 sites within the Oregon side historical distribution and observed only one chum salmon. Currently, chum are occasionally observed in Oregon and may be intercepted at hatchery weirs or at dam passage facilities (e.g., North Fork Dam on the Clackamas River).

Barin (1886) observed that adult chum appeared in the Clackamas River by November and spawned soon afterward. Chum salmon usually spawn in coastal areas, and juveniles outmigrate to sea water almost immediately following emergence from the redds (Salo 1991). Therefore, survival and growth in juvenile chum salmon depends less on freshwater conditions than on favorable estuarine conditions.

No targeted commercial or sport fisheries occur in the mainstem Columbia River for chum salmon. Sport angling for chum was closed in Oregon in 1992. Chum salmon are incidentally harvested in the Columbia River during the late-period coho gill net fishery; less than 42 were captured in 1994. The BRT has noted that chum salmon populations have benefited from reductions in Columbia River gill net fisheries aimed at protecting listed upriver Chinook salmon populations.

## 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:** Willamette Clackamas chum are part of the Columbia River Chum ESU, which was listed as Threatened under the ESA March 25, 1999.
- **Population Description:** The Clackamas River chum 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 NA with a viability goal of Medium.
- **Recovery Goal for Abundance:** The goal is unknown. The viable abundance is 1,100 and the potential abundance is 2,200.

- Productivity Improvement Expectation: Unknown
- Habitat Productivity and Capacity (e.g., from EDT): Unknown; used productivity of 1.5 and a capacity of 100 for modeling purposes.

## 2.2 Current Hatchery Programs Affecting this Population

No chum salmon hatchery program has ever operated in the Clackamas River.

Straying of hatchery-produced chum into the Clackamas River is thought to be negligible. The effective pHOS is estimated to be 0%.

## 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 the same at 1.5 returns per spawner. Average abundance of natural-origin spawners (NOS) would also remain the same 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).

### 3.2.1 HSRG Recommendations

No observations or recommendations were made.

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