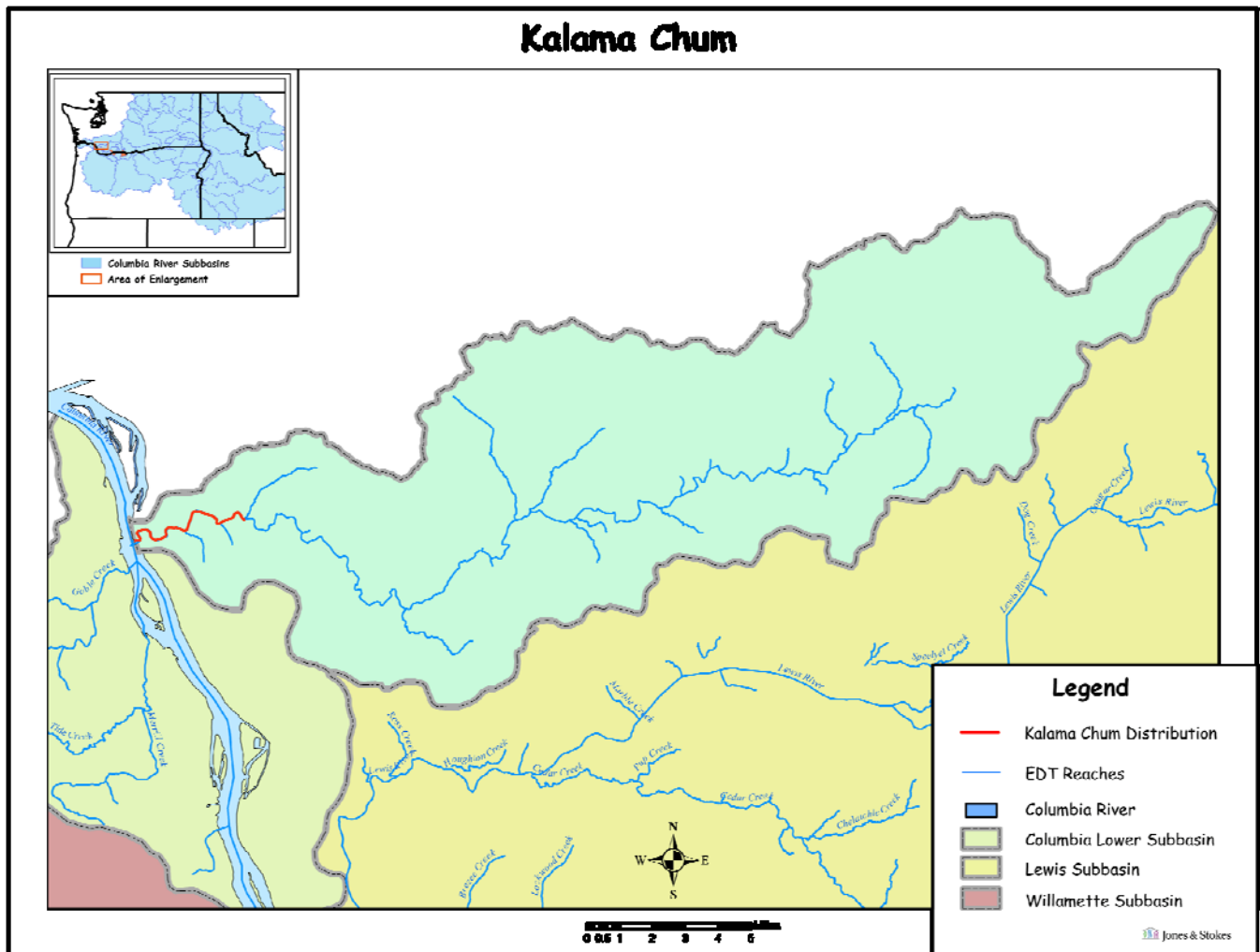


# Hatchery Scientific Review Group Review and Recommendations

## Kalama Chum Population and Related Hatchery Programs

January 31, 2009



# 1 Kalama Chum

This is one of 16 populations historically present in this ESU (Meyers et al. 2006). At one time over one million chum salmon returned to the lower Columbia River (McElhany 2005) while currently, few are observed. Run sizes range from a few hundred to a few thousand adults. Most chum salmon in the Lower Columbia River are observed in the Grays River and a few locations further upstream.

The historical run size of chum salmon to the Kalama was estimated to be between 15,000 and 40,000 adults based on habitat available and modeling. In 1951, 600 chum salmon were estimated to spawn in the Kalama River. Current natural spawning is estimated to be less than 50 fish. Chum spawn in the Kalama River from Modrow Bridge (RM 2.4) and lower Kalama Falls (RM 10).

## 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: Kalama chum salmon are part of the Columbia Chum ESU which was listed as Threatened under the ESA in 1999.
- Population Description: Kalama chum salmon 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: NA
- Habitat Productivity and Capacity: Unknown. For modeling purposes, the following was assumed: Productivity: 1.5; Capacity: 1,000.

### 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 approximately 330 adults. Incidental harvest of the natural and hatchery populations remained unchanged at 7 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).

The HSRG has no specific observations or recommendations for this population.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Kalama 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	327	1.5	7	-
	None									
No Hatchery	None	-	0%	0%	0%	1.00	327	1.5	7	-
	None									
HSRG Solution	None	-	0%	0%	33%	0.00	532	1.3	11	-
	None									
HSRG Solution w/ Improved Habitat	None	-	0%	0%	30%	0.00	612	1.5	12	-
	None									