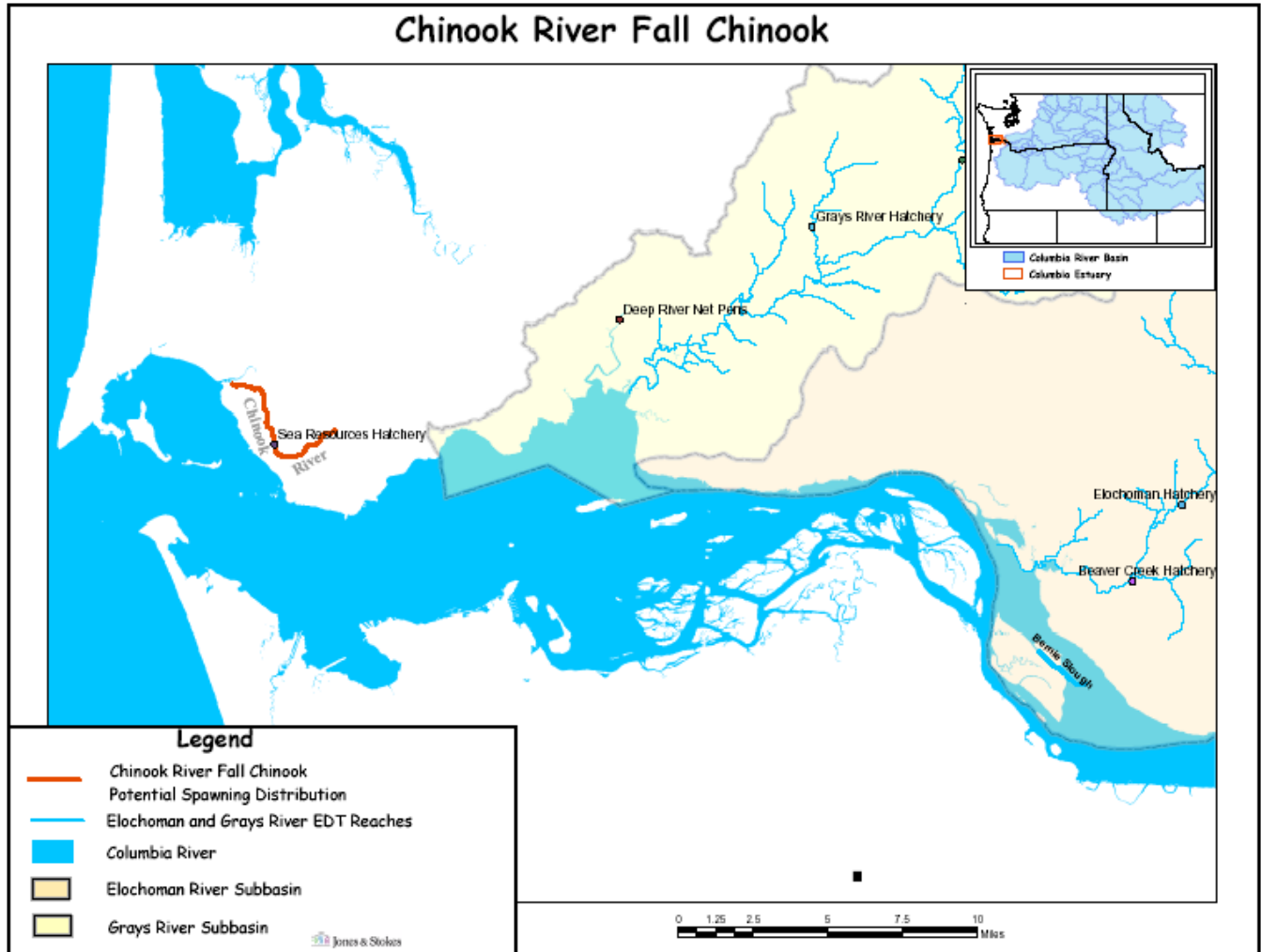


# Hatchery Scientific Review Group Review and Recommendations

## Columbia Estuary Fall Chinook (Chinook River-Sea Resources) Population and Related Hatchery Programs

January 31, 2009



# 1 Columbia Estuary Fall Chinook (Chinook River-Sea Resources)

The Sea Resources Chinook population is believed to be similar to the fall Chinook in the Grays River. No genetic data is available to determine whether the Chinook River stock has diverged from the Grays River tule Chinook. Chinook River fall Chinook are not identified in the WDFW SaSSI 2002 data base. Fall Chinook are native to the Grays River. The natural spawners are now a mixed stock of composite production. Stock mixing very likely began when hatchery supplementation was initiated in 1947 (WDF et al. 1993). The majority of spawning takes place in a 3.6-mile area from the covered bridge on the mainstem (RM 10.7) to the Grays River Salmon Hatchery on the West Fork Grays (RM 1.2). Spawning occurs from late September to mid-November (WDF et al. 1993). In the early 1950s, there was an estimated escapement of 1,000 fall Chinook to the Grays River (WDF 1951). Seining in 1979 captured few naturally-produced, fall Chinook juveniles. This evidence suggests that few natural fall Chinook juveniles were being produced (WDF et al. 1993). Natural spawning escapements from 1967 to 1991 averaged 745 fish, with a low return of 147 in 1967 and a peak of 2,685 in 1978. Grays River Chinook salmon stock status was rated Depressed in 2002, because of a long-term negative trend and a short-term severe decline in escapements in 1997, 1998 and 2000. Generally, lower Columbia tule fall Chinook stocks, including Grays fall Chinook, experienced poor survival in the 1990s.

## 2 Current Conditions

### 2.1 Current Population Status and Goals

The fall Chinook program in the Chinook River has been discontinued. It was primarily an education program, and the population has no viability goals. There is no habitat in the Chinook River that appears suitable for Chinook salmon.

- ESA Status: This population is not listed.
- Current Viability Rating: NA
- Recovery Goal for Abundance: NA
- Productivity Improvement Expectation: NA
- Habitat Productivity and Capacity (from EDT): NA
- Populations Affected by this Hatchery Population Include: NA

### 2.2 Current Hatchery Programs Affecting this Population

The program has been discontinued.

## 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 Recommendations 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 0.4 to 0.8. Average abundance of natural-origin spawners (NOS) would decrease from 29 to 0. Harvest contribution of the natural and hatchery populations would go from 28 to 0.

### 3.2 HSRG Observations/Recommendations

In the Observations and Recommendations 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 incorporate all factors affecting productivity (i.e., habitat quality, hatchery fitness effects, and harvest rates).

#### **Recommendations**

The HSRG recommends that the educational aspect of the Sea Resources program be continued, with emphasis on monitoring and evaluation for lower Columbia River chum salmon.

The HSRG concluded that there was no reason to consider implementing new fall Chinook programs at this location.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Columbia Estuary-Chinook River Fall Chinook. 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%	89%	0.00	29	0.4	28	0
No Hatchery	None None	-	0%	0%	0%	1.00	0	0.8	0	-
HSRG Solution	None None	-	0%	0%	82%	0.00	36	0.5	16	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	80%	0.00	40	0.6	18	0