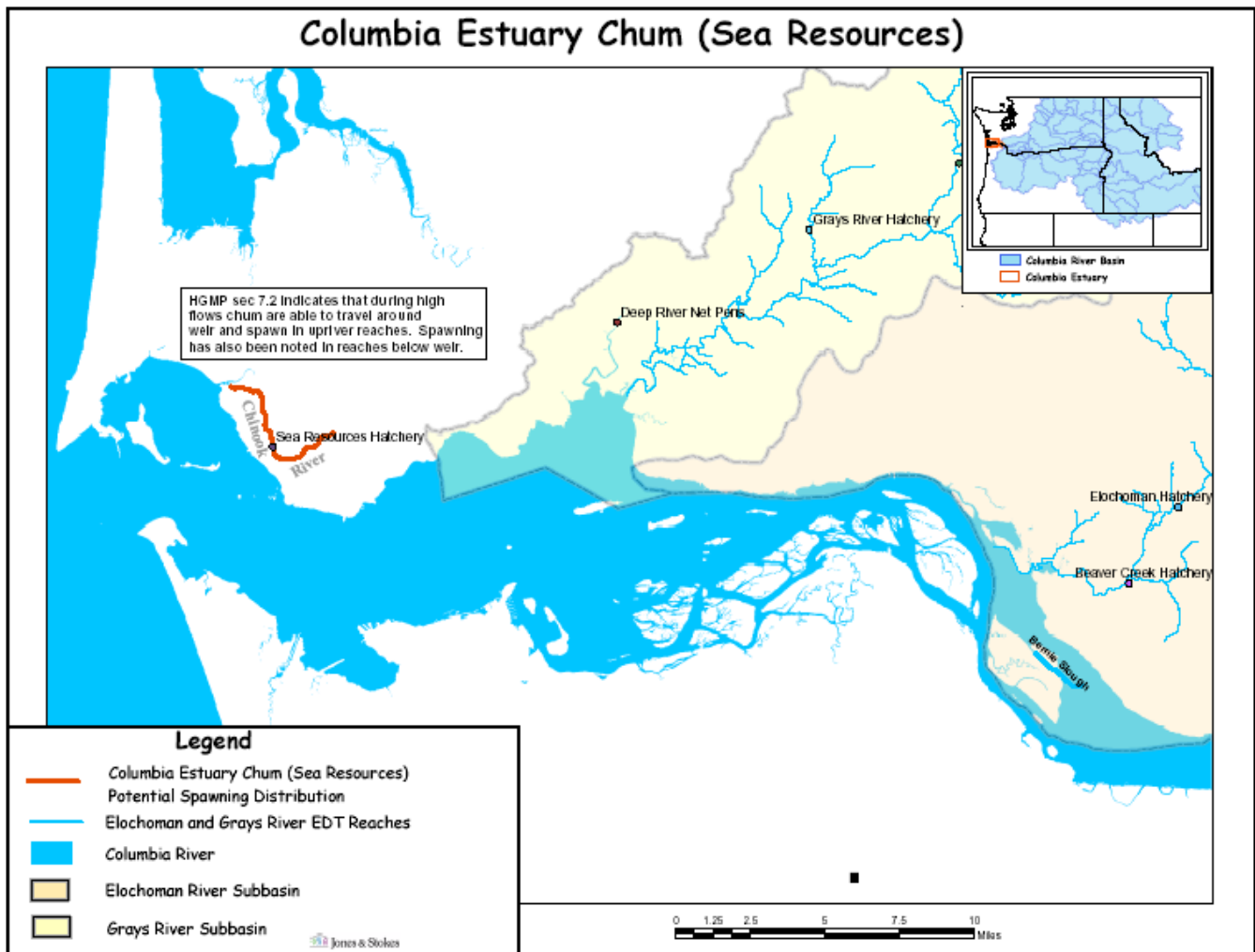


Hatchery Scientific Review Group Review and Recommendations

Columbia Estuary Chinook River Chum Population and Related Hatchery Programs

January 31, 2009



1 Chinook River Chum

Columbia River chum salmon were listed as threatened in 1999. A chum supplementation program has been operated in the Chinook River, site of the program currently being considered, since 1968. Chum populations used in the supplementation program over the years have been derived from various sources, including Bear Creek, Naselle River, and Nemah River. More recently, the chums used have been from the nearby Grays River. Still more recently, chum salmon returning to the Chinook River have served as the source of eggs for the program.

Currently the program has been suspended because of a lack of funds, and Sea Resources is now focusing its efforts on improving fish habitat in the river. Currently, fewer than 300 chum return to the Chinook River annually.

2 Current Conditions

2.1 Current Population Status and Goals

- **ESA Status:** This population is listed as threatened and is part of the Columbia River Chum Salmon ESU. The ESU includes the Chinook River population.
- **Population Description:** Taken together with the Grays River chum population, this population is described as Primary.
- **Current Viability Rating:** Low+, with a goal of High+. Chinook River chum salmon are considered together with the adjacent Grays River population as a Primary component of the ESU (LCSR&SP 2004).
- **Recovery Goal for Abundance:** 6,000 for both the Grays and Chinook components.
- **Productivity Improvement Expectation:** The potential productivity value for the Chinook River chum population is 2.78 (LCSR&SP 2004).
- **Habitat Productivity and Capacity:** Unknown. For modeling purposes, the following was assumed: Productivity 2.5; Capacity 450.
- **Populations Affected by this Hatchery Population:** NA
- **Hatchery Populations of the Same Species that Affect this Population:** Hatchery-chum salmon released from the Grays River and Duncan Creek programs could possibly affect this population.

2.2 Current Hatchery Programs Affecting this Population

No chum salmon hatchery program currently operates in the Chinook River out of the Sea Resources Fish Hatchery. Straying of hatchery-produced chum into the Chinook River is thought to be low.

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program – None
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs – 0 adults

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 2.4 returns per spawner. Average abundance of natural-origin spawners (NOS) would also remain unchanged at 287. Incidental harvest of the natural and hatchery populations stay at 6 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).

Observations

Funding has been discontinued for this program. The current focus is on improving fish habitat in the river.

Recommendations

The HSRG recommends that managers continue the emphasis on habitat restoration and education with a small conservation program (60,000 release) using a 100% natural-origin broodstock collected from the Chinook and Grays rivers. All hatchery-origin fish would need to be marked and the proportion of hatchery fish on the spawning grounds monitored. Allow all returning hatchery fish to spawn naturally.

This, like all chum conservation programs in the lower Columbia, should include a “sunset” clause that would suspend the hatchery program after three generations, unless evidence suggests suspending releases earlier or extending the program beyond three generations would benefit the population.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Chinook River 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%	0.00	287	2.4	6	-
	None									
No Hatchery	None	-	0%	0%	0%	1.00	287	2.4	6	-
HSRG Solution	Int Cons	64.0	0%	0%	68%	0.60	360	2.4	23	1
HSRG Solution w/ Improved Habitat	Int Cons	64.0	0%	0%	65%	0.61	404	2.6	24	1