



# 1 Youngs Bay Tributaries Chum Salmon

Youngs Bay Tributaries chum salmon are one of 16 populations historically present in this ESU. This population includes the Lewis and Clark River, Youngs River, Wallooskee River and Klaskanine River (Meyers et al. 2006). At one time over one million chum salmon returned to the lower Columbia River (McElhany 2005); 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. Few are observed in Oregon. No abundance information is available for Youngs Bay Tributaries chum. Chum counts at the fish weir on Big Creek vary from 0 adults to over 150 adults in 2006. Chum salmon are returning to Youngs Bay at the same time as hatchery coho and are likely experiencing high incidental mortality in the terminal gill-net fisheries.

## 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: This population is listed as threatened and is part of the Columbia River Chum Salmon ESU.
- Population Description: Primary
- Current Viability Rating: NA, with a goal of High; extinction risk is very high for this population (LCSR&SP 2004).
- Recovery Goal for Abundance: NA
- Productivity Improvement Expectation: Not known
- Habitat Productivity and Capacity: Unknown. For modeling purposes, the following assumptions were made: Productivity- 1.5; Capacity- 1,000 .
- Populations Affected by this Hatchery Population: NA
- Hatchery Populations of the Same Species that Affect this Population: Hatchery chum salmon released from the Grays-Chinook River program

### 2.2 Current Hatchery Programs Affecting this Population

No chum hatchery program currently operates in Youngs Bay; however, chum salmon from other programs may stray into the tributaries of Youngs Bay. Under the current scenario, pHOS is estimated at 9% (37 fish).

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 – 37 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 increase from 1.4 to 1.5. Average abundance of natural-origin spawners (NOS) would decrease from 354 to 327. 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).

**Observations**

This population is designated a Primary population.

**Recommendations**

Monitor chum salmon abundance in tributaries of Youngs Bay (Klaskanine, Youngs and/or Lewis & Clark rivers). Consider this population as a likely population for a small conservation hatchery program in Oregon.

Implement a low cost conservation program (100,000 smolt release) using local natural origin broodstock as available and broodstock from natural origin returns from the Grays River as necessary. All hatchery-origin fish would need to be marked and the proportion of hatchery fish on the spawning grounds monitored. Monitor the contribution of hatchery strays in the spawning escapement and natural production.

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 Youngs Bay 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	-	0%	0%	9%	0.00	354	1.4	7	-
	None									
No Hatchery	None	-	0%	0%	0%	1.00	327	1.5	7	-
HSRG Solution	Int Cons	96.1	0%	0%	61%	0.62	685	1.4	37	-
HSRG Solution w/ Improved Habitat	Int Cons	96.1	0%	0%	58%	0.63	773	1.6	39	-