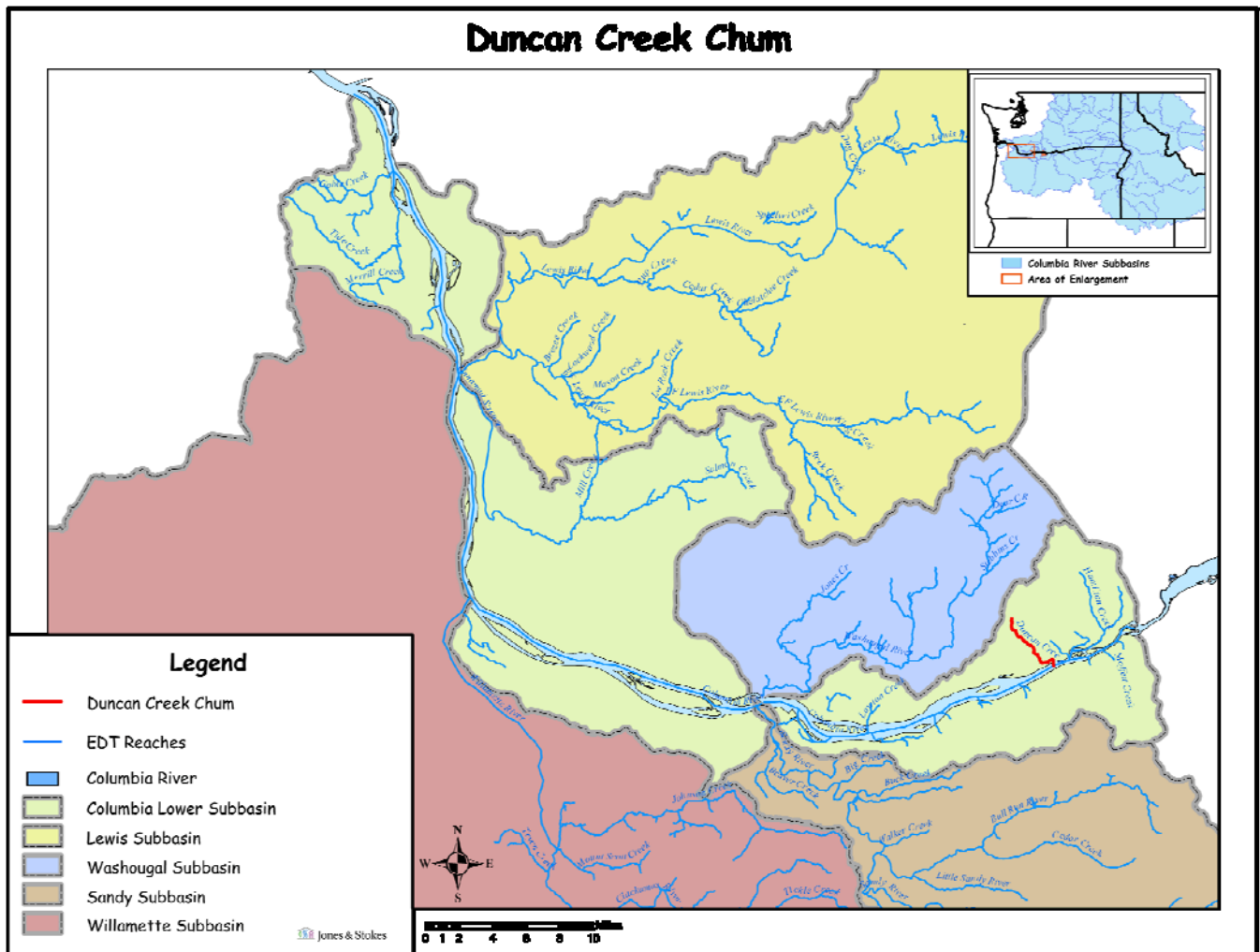


Hatchery Scientific Review Group Review and Recommendations

Duncan Creek Chum Population and Related Hatchery Programs

January 31, 2009



1 Duncan Creek Chum

This population is part of the Columbia River Lower Gorge Tributaries identified in Meyers et al. (2006). It is analyzed as a separate unit to evaluate the Duncan/Ives Island chum conservation program. Natural spawning occurs in Duncan Creek and the Columbia River mainstem around Ives Island.

No information is available on run size or biological traits for this population component.

2 Current Conditions

2.1 Current Population Status and Goals

- **ESA Status:** Duncan Creek chum salmon are part of the Columbia River Chum ESU, which was listed as Threatened under the ESA on March 25, 1999.
- **Population Description:** Duncan Creek Chum population is part of the Lower Columbia Gorge population and is designated as a Primary population in the Lower Columbia Salmon Recovery and Subbasin Plan (LCSR&SP 2004). The LCSR&SP describes current viability as Medium+ with a viability goal of High+.
- **Recovery Goal for Abundance:** 2,800
- **Productivity Improvement Expectation:** NA
- **Habitat Productivity and Capacity (EDT based):** Productivity: 3.7; Capacity: 1,925

2.2 Current Hatchery Programs Affecting this Population

This is an integrated conservation program intended to help recover threatened chum salmon. Broodstock is collected in Duncan Creek and taken to Washougal Hatchery for spawning, incubation and early rearing. All hatchery progeny are otolith marked to distinguish hatchery fish from natural-origin chum. The current program goal is 100,000 fed fry at 450 fpp; however, in 2006 only 25,000 fry were produced. Fry are planted back into Duncan Creek. Additionally, salvaged adults from the Columbia River near Ives Island are released into Duncan Creek.

The goal of the program is a self-sustaining population in rehabilitated Duncan Creek habitat. This will be accomplished by a combination of juvenile supplementation and releases of wild chum salmon adults into renovated spawning habitat in Duncan Creek.

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program – 1,035 adults
- 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 increase slightly from 3.5 to 3.6 returns per spawner. Average abundance of natural-origin spawners (NOS) would decrease from 1,650 to 1,520 adults. Incidental harvest of the natural and hatchery populations would decrease from 57 fish to 31 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 is designated a Primary population with an existing hatchery program (100,000 release).

Recommendations

The HSRG recommends continuation of the hatchery program using local natural-origin broodstock as available and broodstock from natural origin returns from the Lewis River as necessary until the recovery goals are achieved and the population becomes self-sustaining. Fed fry should be adipose fin-clipped to distinguish HOR from NOR adults. This would allow collection of 100% NOR adults for broodstock to increase the PNI above 0.67. Monitor contribution of hatchery strays in 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 suggest suspending releases earlier or extending the program beyond three generations.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Duncan Creek 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	Int Cons	99.9	5%	0%	37%	0.62	1,652	3.5	57	25
No Hatchery	None None	-	0%	0%	0%	1.00	1,515	3.6	31	-
HSRG Solution	Int Cons	99.9	5%	0%	38%	0.72	1,630	3.6	57	55
HSRG Solution w/ Improved Habitat	Int Cons	99.9	5%	0%	36%	0.74	1,826	3.9	61	55