

1 Mill/Abernathy/Germany Creek Fall Chinook

The Mill Creek, Abernathy Creek and Germany Creek fall Chinook stocks have been combined into a single stock based on the Lower Columbia Technical Recovery Team's conclusion that the individual watersheds were too small to support viable Chinook populations.

Data for Mill Creek are total escapement estimates expanded from annual peak live plus dead spawner counts from the Mill Creek Road Bridge (RM 2.0) downstream to the mouth. Data for Abernathy Creek are total escapement estimates expanded from annual peak live plus dead spawner counts from the U.S Fish and Wildlife Service Abernathy Creek Salmon Culture Technology Center weir (RM 3.0) downstream to the mouth of the creek. Data for Germany Creek are total escapement estimates expanded from annual peak live plus dead spawner counts from RM 3.5 downstream to the mouth of the creek.

Stock status was rated Depressed in 2002, because of chronically low escapements. Generally, tule fall Chinook stocks, such as Mill/Abernathy/Germany Creeks fall Chinook, experienced poor survival in the 1990s. Natural spawning abundance is probably more a reflection of U.S. Fish and Wildlife Service Abernathy Creek Salmon Culture Technology Center and other hatchery stray rates than of natural production. (SaSSI 2002).

2 Current Conditions

2.1 Current Population Status and Goals

- **ESA Status:** This population is listed as threatened and is part of the Lower Columbia Chinook ESU.
- **Population Description:** The population has been designated as a Contributing population (LCSR&SP 2004). The historical significance of this population is uncertain. They were largely represented by strays from Abernathy Hatchery until that program was eliminated. They currently support natural spawning populations, with the largest number in Mill Creek.
- **Current Viability Rating:** Low, with a goal of Medium.
- **Recovery Goal for Abundance:** 1,100.
- **Productivity Improvement Expectation:** Unknown.
- **Habitat Productivity and Capacity:** Productivity 3.0; Capacity 300. The HSRG assigned a default value to estimate the current habitat for the Mill/Abernathy/Germany Creek tule fall Chinook, since no other estimates of productivity and capacity were available.
- **Populations Affected by this Hatchery Population Include:** None.

2.2 Current Hatchery Programs Affecting this Population

Currently there is no hatchery program associated with this population; therefore, the No Hatchery scenario describes the current condition.

- The PNI for the population is 1.00 and the pHOS is 19%:
- The adjusted productivity for the stock (including harvest impacts) is estimated to be 1.52.
- Based on productivity and capacity assumptions above, the projected average natural-origin escapement is approximately 60 fish annually.
- The annual harvest contribution is estimated to be 50 fish.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin integrated hatchery program: NA
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 64 fish

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 1.1 to 2.2. Average abundance of natural-origin spawners (NOS) would increase from 228 to 565. Harvest contribution of the natural and hatchery populations would go from 219 to 544.

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).

Observations

This population has been designated a Contributing population managed for natural production. It is questionable if these streams historically supported tule fall Chinook, suggesting a Stabilizing designation is more appropriate. There was a tule fall Chinook program that was terminated in the last decade. There is no terminal fishery in these small creeks; it is all in the lower Columbia. The lower reaches of these creeks contain high quality chum habitat, a species that is native to the creeks.

Recommendations

The HSRG identified this as a candidate to develop a segregated harvest program of 1.0 million fish to replace tule production reduced elsewhere. This is consistent with its designation as a Stabilizing population.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Columbia Estuary: Mill, Abernathy and Germany Creek 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	-	100%	0%	18%	0.00	228	1.1	219	0
	None	-	100%	0%	18%	0.00	228	1.1	219	0
No Hatchery	None	-	0%	0%	0%	1.00	565	2.2	544	-
	None	-	0%	0%	0%	1.00	565	2.2	544	-
HSRG Solution	None	-	0%	0%	66%	0.00	783	1.5	350	0
	Seg Harv	1,023.8	75%	0%	66%	0.00	783	1.5	7,079	5,571
HSRG Solution w/ Improved Habitat	None	-	75%	0%	64%	0.00	868	1.7	388	0
	Seg Harv	1,023.8	75%	0%	64%	0.00	868	1.7	7,079	5,571