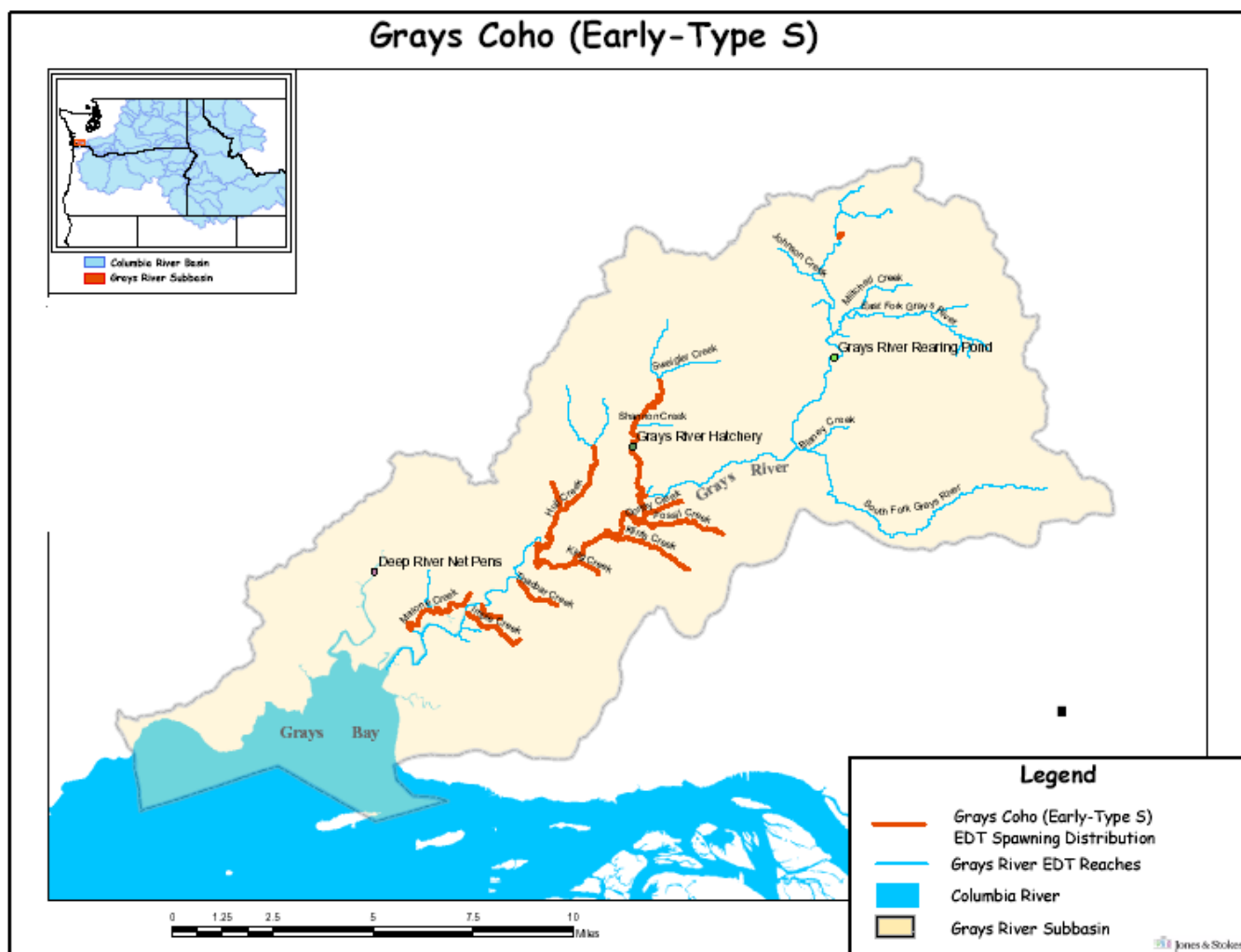


Hatchery Scientific Review Group Review and Recommendations

Grays River Coho Population and Related Hatchery Programs

January 31, 2009



1 Grays River Coho

Native Grays River coho were historically a Type N stock characterized by later spawn timing (peaking in November and December) and an ocean distribution north of the Columbia River. The Type S hatchery production in the river, and subsequent naturally spawning hatchery individuals, has influenced the natural spawn timing which now peaks in late October. Type N escapement in 1951 was estimated at ~2,500 adults, but current abundance is unknown, according to the Grays Coho SaSSI document (WDFW 2002).

Grays coho were identified as a stock based on their distinct spawning distribution and run timing. Most spawning takes place in lower river tributaries, with the natural population spawning from September to January. Current abundance of the natural population is unknown. Spawning takes place in all accessible locations in the basin with a substantial portion occurring in lower basin tributaries. According to the LCSRSP, natural production of Type N stock is likely <15% of the modeled smolt density estimate of 125,874 smolts.

2 Current Conditions

2.1 Current Population Status and Goals

At the time that the Lower Columbia Salmon Recovery and Subbasin Plan were written, coho were not listed under the ESA and so were not included in the Plan's recovery goals. A natural Grays Coho Type N population is documented in the LCSRSP and is combined with the Chinook River population for viability ratings and abundance goals. The WDFW SaSSI 2002 report indicates that a native population with later run timing than the hatchery population is still present in the system, but abundance data was not available at the time of the inventory. It was rated as depressed in the 1992 inventory with an unknown status in 2002.

- ESA Status: This population listed as Threatened.
- Population Description: Grays River coho are a Primary population.
- Current Viability Rating: Low, with a goal of High
- Recovery Goal for Abundance: 600, with a potential of 4,600
- Productivity Improvement Expectation: No productivity improvement expectation is provided by the LCSRSP. A 10% improvement in habitat is given for steelhead after implementation of the Recovery Plan. Until better data is available, assume that coho would experience the same 10% increase in habitat after implementation of the Plan.
- Habitat Productivity and Capacity (from EDT): Productivity 3.84; Capacity 1,623
- Hatchery Populations that Affect this Natural Population: Grays River Coho (Early Type S)

2.2 Current Hatchery Programs Affecting this Population

The only hatchery population of the same species that affects this population (e.g., through straying) is the Grays River coho (Early Type S) program. The Grays River Coho HGMP describes this program as integrated; however, only marked, hatchery origin fish are collected for broodstock. The intent has been to collect 707 broodstock at a 1:1 female to male ratio with a 1%

jack component for rearing and on-station release of 150,000 smolts and to transfer 220,000 to the Deep River Net Pens. Broodstock collections from 1990 through 2001 averaged 680 adults, with average on-station releases of 263,000 smolts and average releases from the Deep River net pens of 375,598 smolts. Currently, Type S broodstock collection takes place during October with volitional releases during late April and early May. For the on-station release, 20 percent are coded-wire tagged and the remainder are adipose clipped. For the Deep River Net Pen releases, 12.5 percent are coded-wire tagged and adipose clipped, with the remainder being only adipose clipped.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 225 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 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 1.6 to 3.1. Average abundance of natural-origin spawners (NOS) would increase from 549 to 988. Harvest contribution of the natural and hatchery populations would go from 511 to 235.

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

The Grays River coho is considered a Primary population for recovery. This population has a natural spawning component (Type N), a segregated on-station component (Type S), as well as the segregated Deep River net pen program (Type S). There is a rack suitable for collecting early arriving coho, but it is not in place to collect late arrivals. It was noted, however, that the hatchery is on a different fork of the river than is used by this coho population.

Eliminating Grays Hatchery as the source of fish for the Deep River net pen production would result in fewer strays to Grays River.

Recommendations

All hatchery-origin fish need to be adipose fin-clip marked and the proportion of fish on the spawning grounds controlled at the hatchery intake weir. The water intake weir needs to be updated to better control fish access to spawning habitat and to protect the hatchery water supply.

The HSRG recommends that an integrated harvest program (155,000 fish release, tagged and a random portion of the population clipped for selective harvest) be developed for the native component (Type N coho).

Eliminate the use of Grays River hatchery to support the Deep River net pen program. Support for the Deep River program could be supplied from Elochoman or other WDFW facilities that rear Type S coho (Lewis or Toutle).

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Grays River Coho. 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%	25%	0.00	549	1.6	131	0
	Type S Seg Harv	150.4	90%						380	S
No Hatchery	None None	-	0%	0%	0%	1.00	988	3.1	235	-
HSRG Solution	Int Both	155.9	20%	90%	3%	0.87	912	3.0	2,390	507
	Type S Seg Harv	-	90%						-	-
HSRG Solution w/ Improved Habitat	Int Both	155.9	20%	90%	3%	0.89	1,066	3.3	2,427	507
	Type S Seg Harv	-	90%						-	-