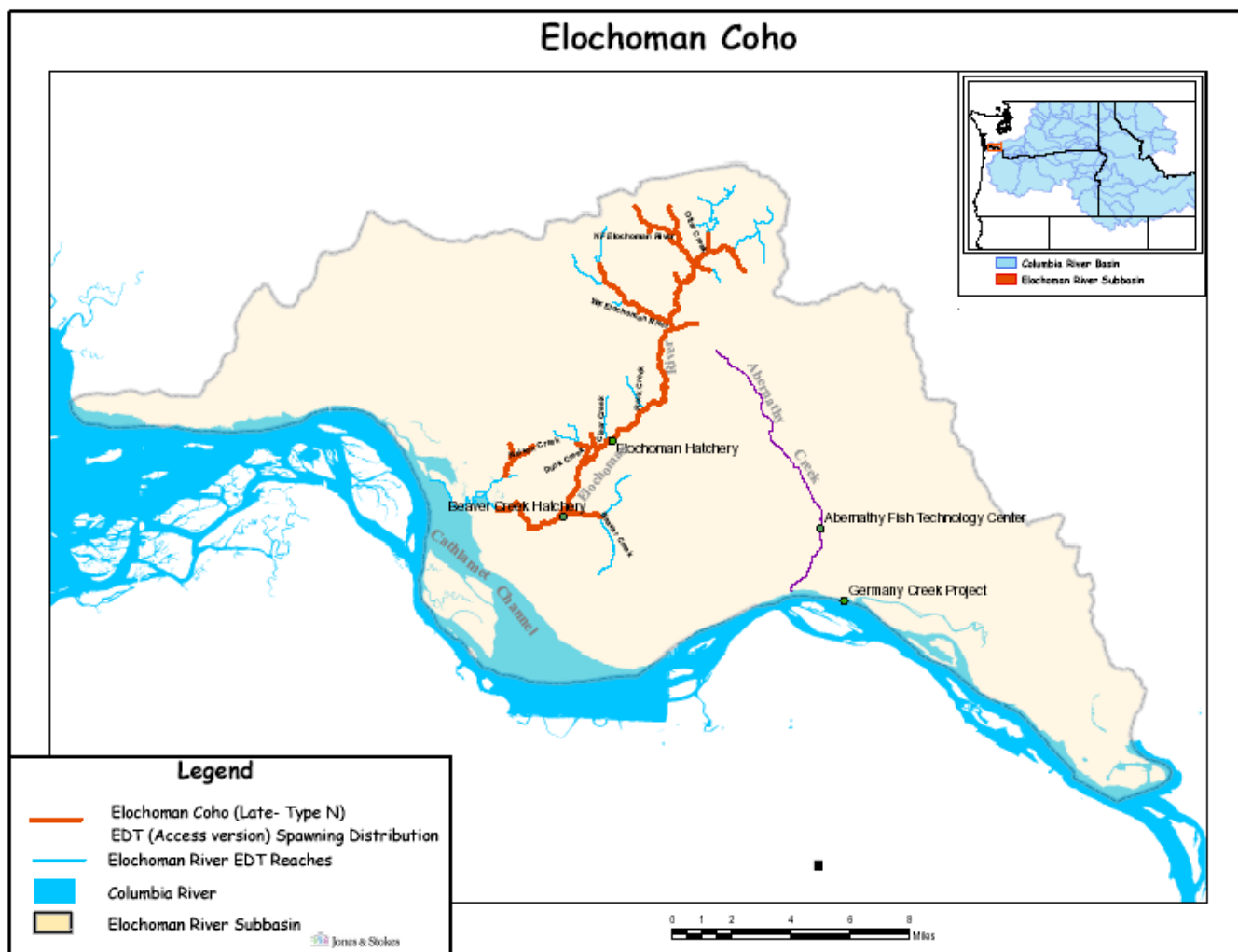


Hatchery Scientific Review Group Review and Recommendations

Elochoman River Coho Population and Related Hatchery Programs

January 31, 2009



1 Elochoman River Coho

The Elochoman coho population is part of the threatened Lower Columbia coho ESU. It is designated as a Primary population. There are two coho hatchery programs in the Elochoman. One is based largely on broodstock originating from the Elochoman (Type N), and the other is based on broodstock of Toutle River origin (Type S).

2 Current Conditions

2.1 Current Population Status and Goals

The natural coho population in the Elochoman is a fraction of its historic abundance. Natural origin spawning escapement numbers were not available, but the population is rated as low in viability in the LCRSRP.

- **ESA Status:** This population is listed as threatened and is part of the threatened Lower Columbia ESU.
- **Population Description:** The Elochoman population is one of 13 in the ESU that are designated as Primary populations (LCSR&SP 2004).
- **Current Viability Rating:** Low, with a goal to achieve a High rating
- **Recovery Goal for Abundance:** 600 naturally spawning fish
- **Productivity Improvement Expectation:** The recovery plan (LCSR&SP 2004) does not provide a productivity improvement expectation for coho; however, for steelhead, a value of 10% is given. Until better information becomes available, a 10% improvement in habitat can be expected from implementation of the recovery plan.
- **Habitat Productivity and Capacity (from EDT):** Productivity 3.7; Capacity 1,300
- **Adjusted Productivity (accounting for fitness loss and harvest):** 1.4

2.2 Current Hatchery Programs Affecting this Population

There are two coho hatchery programs in the Elochoman. One is an integrated program derived from native brood (497,000 smolts); the other is a segregated program with brood originating from the Toutle (Type S) (418,000 smolts). The broodstock for the current integrated (Type N) program is of local origin. Adults are captured from volitional returns to the fish ladder-V trap near the Elochoman Hatchery, where incubation and rearing occur. This hatchery program is described as an integrated harvest program.

- The assumptions presented in AHA suggest a pNOB of about 3 percent and a pHOS of close to 50 percent, leading to a PNI of about 0.05.
- **Projected Average Natural Origin Escapement:** Likely does not consistently meet the goal of 600 spawners.
- **Average Harvest Contribution:** 8,970 fish, consisting mostly of hatchery fish from the integrated and segregated programs.
- Hatchery returns substantially exceed broodstock needs.

- Estimated number of hatchery strays affecting this program:
- Hatchery strays from in-basin integrated hatchery program: 668 fish
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 864 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 662 to 827. Harvest contribution of the natural and hatchery populations would go from 8,970 to 160.

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 a Primary population. The barrier at the hatchery is in disrepair and needs to be addressed to achieve higher trap efficiencies. The current segregated Type S program is inconsistent with the Primary designation for this population because of the inability to capture hatchery returns. The HSRG observed the hatchery facility to be in poor condition.

Currently this hatchery produces both Type N and Type S coho for a harvest program. WDFW is proposing to rebuild the rack in the lower river for Chinook collection; however, repair of existing barrier at the hatchery would still be needed if an integrated Type N program were to be emphasized.

We observe that the Type S segregated program could be increased without impacting compliance with a primary population designation.

Recommendations

The HSRG recommends reducing the Type N integrated program to 150,000 to reduce risks to recovery of naturally produced coho.

Continue the Type S segregated program (expand to 800,000 smolt release) if, and only if, repairs are made to the barrier at the hatchery (to exclude 95% of hatchery fish upstream of the barrier). This repair is a high priority.

Explore opportunities to produce an additional 400,000 fish release at Beaver Creek Hatchery.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Elochoman 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	Late Type N Int Both	496.1	90%	0%	65%	0.04	662	1.6	4,774	5,509
	Type S Seg Harv	415.0	90%						4,196	4,335
No Hatchery	Late Type N None None	-	0%	0%	0%	1.00	827	3.1	160	-
HSRG Solution	Late Type N Int Both	146.5	95%	90%	8%	0.87	685	2.9	1,893	1,520
	Type S Seg Harv	1,201.1	95%						20,878	5,013
HSRG Solution w/ Improved Habitat	Late Type N Int Both	146.5	95%	90%	6%	0.89	820	3.3	1,920	1,520
	Type S Seg Harv	1,201.1	95%						20,878	5,013