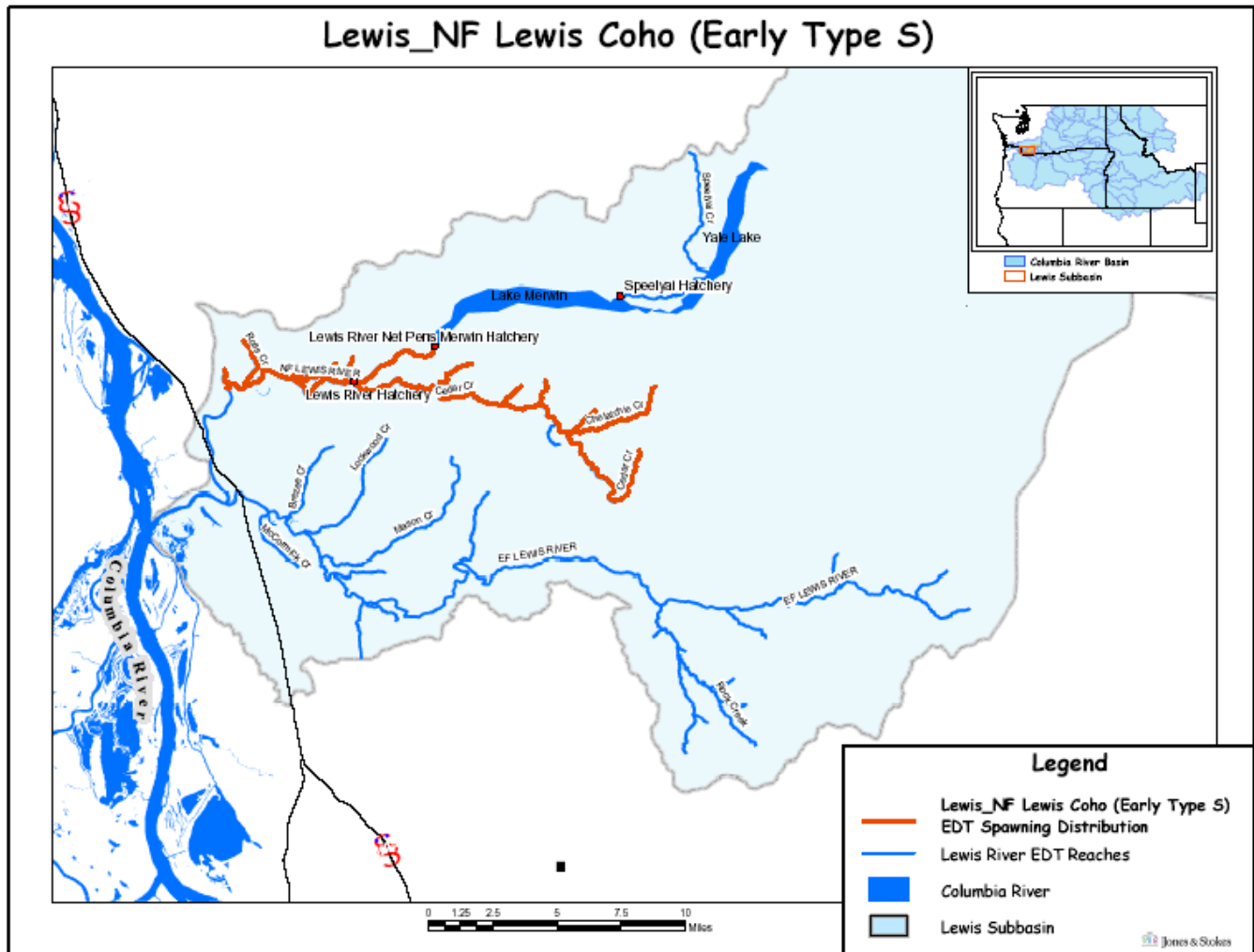


Hatchery Scientific Review Group Review and Recommendations

North Fork Lewis River Coho Population and Related Hatchery Programs

January 31, 2009



1 North Fork Lewis River Coho

The historical North Fork Lewis River adult population is estimated to be from 7,500 to 85,000 fish. Both early and late stocks were present historically, with the early stock spawning primarily in the upper Lewis River. Current returns are unknown, but assumed to be low and limited to the habitat downstream of Merwin Dam. Early coho are expected to be reintroduced to the habitat upstream of the hydropower facilities in the near future. Natural spawning currently occurs in tributaries below Merwin Dam including Ross, Johnson, Colvin, North Fork and South Fork Chelatchie, and Cedar creeks. A number of hatchery-produced fish spawn naturally. Early stock coho spawn from late October into late November. Juvenile rearing occurs upstream and downstream of spawning areas. Juveniles rear for a full year in the Lewis River subbasin before migrating as yearlings in the spring (LCSR&SP 2004).

2 Current Conditions

2.1 Current Population Status and Goals

North Fork Lewis River coho are part of the Lower Columbia Coho ESU and are listed as threatened under ESA.

- ESA Status: Threatened
- Population Description: The North Fork Lewis River coho population is one of 13 in the ESU and is designated as a contributing population (LCSR&SP 2004).
- Current Viability Rating: Low, with a goal of Medium
- Recovery Goal for Abundance: 600 natural spawners
- 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, we assume a 10% improvement in habitat could be expected from implementation of the recovery plan.
- Habitat Productivity and Capacity (from EDT): Late Type N - Productivity 5.20; Capacity 2,900; Early Type S - Productivity 4.7; Capacity 14,500
- Populations Affected by this Hatchery Population: Co-occurring natural salmon and steelhead populations in the local tributary areas and the Columbia River mainstem. Of primary concern are the ESA-listed salmonids.
- Hatchery Populations of the Same Species that May Affect this Natural Population: Lewis River Type N-Late coho and Lewis River Type S –Early coho. The specific effects, if any, are unknown. Coho have been planted in the Lewis River subbasin since 1930. Extensive hatchery coho releases have occurred since 1967.

2.2 Current Hatchery Programs Affecting this Population

The current hatchery programs are described as a proposed integrated harvest program; however, they have been operated as segregated programs. The current condition model parameters assume segregated harvest programs.

The current hatchery program is described as a proposed integrated harvest program although only hatchery returns are used for broodstock. The Type N broodstock for the current program is of local origin. Adults are captured from volitional returns to traps at either the Lewis or Merwin hatcheries. The current annual program broodstock goal is 3,800 fish, equally divided by sex.

This level is dependent upon whether Washougal Hatchery supplies 2.75 million fish for the Klickitat River coho plants.

The North Fork Lewis Type N program includes 760 broodstock, approximately 815,000 smolts released on-station, and 460,000 eyed eggs to Fish First for RSI production in tributaries of the North Fork Lewis River.

The hatchery return surplus is 9,679 fish, substantially exceeding broodstock needs. The average harvest contribution is 12,710 fish. An additional 400,000 eyed eggs of 100% natural origin broodstock are collected and sent to Fish First for RSI production in the North Fork Lewis River.

- Projected pHOS Estimates (includes strays from all hatchery programs): 66%
- Estimated Adjusted Productivity (with harvest and fitness factor effects from AHA): 3.3
- Projected Average Natural Origin Escapement: 1,795

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program: 1,235 fish
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 2,983 fish

The Type S broodstock for the current program is of local origin. Adults are captured from volitional returns to traps at either the Lewis River Hatchery or at Merwin Dam. The program includes 760 broodstock and approximately 880,000 smolts. The hatchery return surplus is 13,795 fish, substantially exceeding broodstock needs. The average harvest contribution is 13,732 fish.

- Projected pHOS Estimates (includes strays from all hatchery programs): 0%
- Estimated Adjusted Productivity (with harvest and fitness factor effects from AHA): 3.9
- Projected Average Natural Origin Escapement: 10,043

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program: N/A
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 31 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 3.3 to 4.4 for the Type N population and would remain at 3.9 for the Type S population. Average abundance of natural-origin spawners (NOS) would increase from 1,821 to 2,102 for the Type N population and would remain increase from 10,112 to 10,159 for the Type S population. Harvest contribution of the natural and hatchery populations would go from 12,979 to 407 for the Type N population and would go from 14,787 to 1,965 for the Type S population..

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

Both Type S and N coho are reared in the North Fork Lewis. The Type N population is a Contributing population while the Type S segregated harvest program is also a gene bank for reintroduction of coho above Merwin Dam. The majority of the habitat in the basin is in the upper river, where potentially a Primary Type S population could be established; however, currently there is no provision for juvenile passage. Once passage is established, this population may meet the standards of a Primary population. In the long term, the recent hydropower settlement agreement includes a reintroduction intent into the upper North Fork of Type S coho.

As hatchery programs are currently operated, the Type N population in the lower river does not meet the standards of a Contributing population.

Recommendations

Convert the existing segregated Type N program to an integrated program of 230,000 smolts to be consistent with standards for a Contributing designation for the North Fork Lewis Type N population.

Convert the existing Type S segregated program to a gene banking program that would produce 120,000 smolts for future reintroduction upstream of Merwin Dam. This change in the Type S program would not affect the status of the North Fork Lewis Type N population. Once the upper North Fork population is restored, the Type S hatchery program could be increased.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for North Fork Lewis 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	Type N Int Harv	40.0	0%	0%	66%	0.60	1,821	3.3	1,094	1
	Type S None	-	0%	0%	0%	1.00	10,112	3.9	1,956	0
	Type N Hatchery Seg Harv	815.1	90%						11,885	9,678
	Type S Hatchery Seg Harv	880.0	90%						12,830	13,795
No Hatchery	Type N None	-	0%	0%	0%	0.00	2,102	4.4	407	-
	Type S None	-	0%	0%	0%	1.00	10,159	3.9	1,965	-
HSRG Solution	Type N Int Harv	231.6	90%	0%	19%	0.62	1,792	3.5	4,015	3,442
	Type S None	-	0%	0%	0%	1.00	10,136	3.9	1,981	0
	Type N Hatchery Seg Harv	-	90%						-	-
	Type S Hatchery Seg Harv	115.8	90%						2,090	1,454
HSRG Solution w/ Improved Habitat	Type N Int Harv	231.6	90%	0%	17%	0.64	2,072	3.9	4,070	3,442
	Type S None	-	0%	0%	0%	1.00	11,501	4.3	2,247	0
	Type N Hatchery Seg Harv	-	90%						-	-
	Type S Hatchery Seg Harv	115.8	90%						2,090	1,454