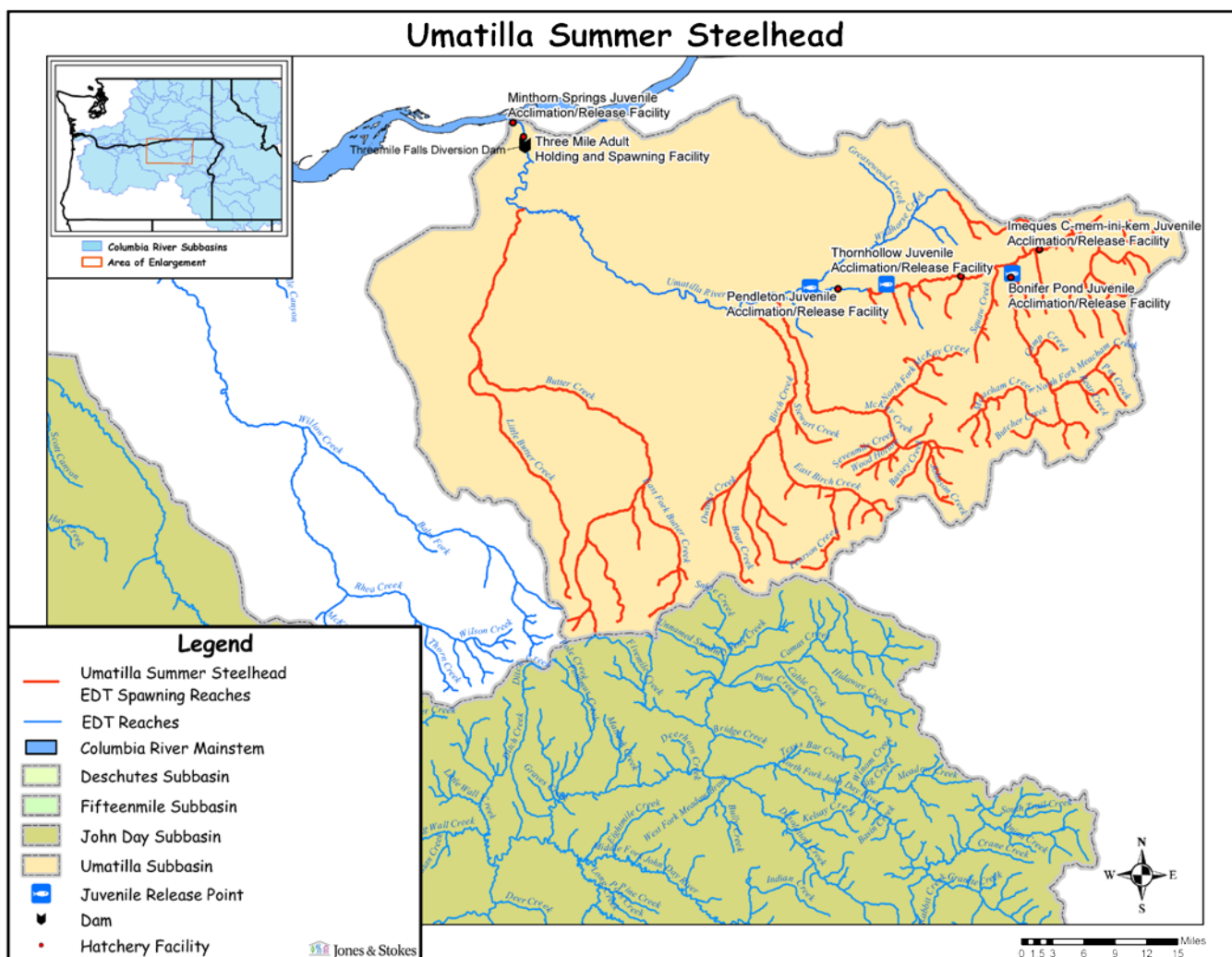


Hatchery Scientific Review Group Review and Recommendations

Umatilla Summer Steelhead Population and Related Hatchery Programs

January 31, 2009



1 Umatilla Summer Steelhead

The Umatilla/Willow subbasin is a 3,714 square mile area in northeastern Oregon located primarily in Umatilla and Morrow counties, with a small portion extending into Union County. The Umatilla/Willow subbasin is composed of four drainages: the Umatilla subbasin, the Willow Creek subbasin, the Six-Mile Canyon drainage, and the Juniper Canyon drainage. The mainstem Umatilla River is 89 miles long and the river and its tributaries drain an area of nearly 2,290 square miles. Willow Creek is 79 miles long and drains an area of about 880 square miles. The Six-Mile Canyon area, which contains intermittent streams that rarely drain into the Columbia River, is 472 square miles. The mainstem of Juniper Canyon Creek is 19 miles long and drains 72 square miles (Umatilla Subbasin Plan 2004).

Adult returns to the Umatilla are recorded as fish pass Three Mile Dam located at RM 4 on the mainstem Umatilla River. Returns of naturally-produced summer steelhead averaged 1,663 between 1988 and 2003 with a high of 3,562 in 2002 and a low of 724 in 1991. Hatchery returns to Three Mile Dam between 1988 and 2003 averaged 2,412 adults with a high of 5,520 in 2002 and a low of 1,111 in 1991 (Umatilla Subbasin Plan 2004).

2 Current Conditions

2.1 Current Population Status and Goals

This section describes the current population, status, and goals for the natural population.

- **ESA Status:** Naturally spawning summer steelhead in the Umatilla system are included in the Middle Columbia River Summer Steelhead DPS which was listed as Threatened under the ESA in 1999. This status was reaffirmed in 2006.
- **Population Designation:** Using a rating system similar to that used by the recovery planners for the lower Columbia and Willamette arrives at a designation of Contributing.
- **Current Viability Rating:** Unknown
- **Recovery Goal for Abundance:** Unknown
- **NOAA Fisheries Interim Abundance Target:** 4,000
- **Productivity Improvement Expectation:** Unknown
- **Habitat Productivity and Capacity (from EDT):** Productivity: 1.91, Capacity: 4,230

2.2 Current Hatchery Programs Affecting this Population

An integrated harvest program currently operates in the basin, collecting broodstock at Three Mile Dam for production and release of Stock 091 summer steelhead. Broodstock are selected at random from adults entering the east bank ladder trap at Three Mile Dam. Broodstock are anesthetized using CO₂ and are transported for spawning to the Minthorn Springs facility located on Minthorn Springs Creek at ~ RM 64 on the Umatilla River. Ripe fish are spawned from early April to late May with one male being paired with one female. Pairing always uses wild x wild or wild x hatchery to reduce potential negative effects of hatchery x hatchery domestication. Only 17% of spawned broodstock are Umatilla Hatchery-origin fish, as identified by fin clips and coded-wire tags. Fertilized eggs are transported in five gallon buckets to the Umatilla Hatchery

on the Columbia River approximately 11 miles downstream of the Umatilla/Columbia confluence. Here they are reared on Columbia River water until ready for transport to acclimation sites in the Umatilla River. Juveniles are moved to Pendleton and Minthorn acclimation sites in late March for a 4-week acclimation. Bonifer Acclimation site is also used but there have been problems getting all of the juveniles out of the ponds so recently this facility has been used only as a release site. About 50,000 juveniles are released at ~5.1 fpp (1992-2002 average) at Pendleton, Minthorn, and Bonifer for a total release of 150,000 juveniles in late April. Forty percent of each release group is coded-wire tagged and 100% are adipose clipped.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin integrated hatchery program: 723 fish
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 157 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 slightly from 1.6 to 1.8. Average abundance of natural-origin spawners (NOS) would decrease from approximately 2,034 fish to approximately 1,832 fish. Harvest contribution of the natural and hatchery populations would go from approximately 439 fish to approximately 142 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

The current 150,000 summer steelhead integrated smolt program is consistent with the guidelines for a primary population. Since inception, this program has used natural origin adults for broodstock.

Given that hatchery fish make up about 30% of the escapement, there appears to be hatchery fish available for additional harvest.

Recommendations

The HSRG has no specific recommendations to improve upon this program.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Umatilla Summer Steelhead. 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 Both	149.9	1%	0%	24%	0.80	2,034	1.6	439	4
									0	0
No Hatchery	None None	-	0%	0%	0%	1.00	1,832	1.8	142	-
HSRG Solution	Int Harv	149.9	1%	0%	24%	0.80	2,011	1.6	437	4
									0	0
HSRG Solution w/ Improved Habitat	Int Harv	149.9	1%	0%	21%	0.82	2,407	1.8	468	4
									0	0