

Expanded Acclimation Plan

Yakama Nation Fisheries Resource Management

1. Background

YN's Expanded Acclimation Project (Project) is based on the premise that acclimating salmon and steelhead in a manner that mimics natural systems can increase the effectiveness of integrated (conservation) hatchery programs and can be used to improve the Viable Salmonid Population (VSP) status of ESA listed spring Chinook and steelhead.

The Columbia River Basin Fish Accords (MOA) recognize that hatchery actions can provide important benefits to ESA listed species and to the Tribes, supporting treaty fishing rights. This Project seeks to improve the efficacy of current supplementation programs by providing additional short-term acclimation sites with the purpose of improving the spawning distribution of adult returns and/or homing fidelity, which may contribute to improved productivity and survival.

The concept of acclimating salmon smolts in 'natural' ponds has been thoroughly tested over the last decade as part of YN's coho restoration project in the Wenatchee and Methow Rivers. The coho restoration project has demonstrated both high survival rates (juvenile and adults) as well as adult returns with SARs comparable or higher than established supplementation programs in the Upper Columbia (YN 2010). More recently YN has demonstrated that the technique of short term acclimation and co-mingling species is a viable method of acclimating smolts (Kamphaus 2011). However adult return data (SARs etc) from the comingled releases are still being collected and are not yet available.

Beginning in 2014, as a result of the HCP No-Net-Impact (NNI) recalculation, smolt release numbers from most conservation hatchery programs in the Methow and Wenatchee basin will be significantly reduced. Because of this reduction we believe it is crucially important to that each program be operated in a manner which maximizes efficacy of the supplementation effort.

To determine where this Project might be able to improve the effectiveness of supplementation programs in the Methow and Wenatchee basins, we reviewed the most recent 5-year review for hatchery programs cooperated by CCPUD and DCPUD (Hillman et al., 2011; Murdoch et al., 2011). During this review we focused primarily on spawner distribution (Objective 2) and homing fidelity (Objective 5) for spring Chinook and steelhead; two objectives that we believe the Expanded Acclimation program is uniquely suited to help achieve.

2. Proposal

2.1 Methow Spring Chinook (Upper Methow; 2015 and beyond)

Unlike releases into the Twisp or Chewuch, spring Chinook that are released from the Methow FH and WNFH have a spawning distribution significantly different than that of natural origin fish (Figure 1; Murdoch et al., 2011).

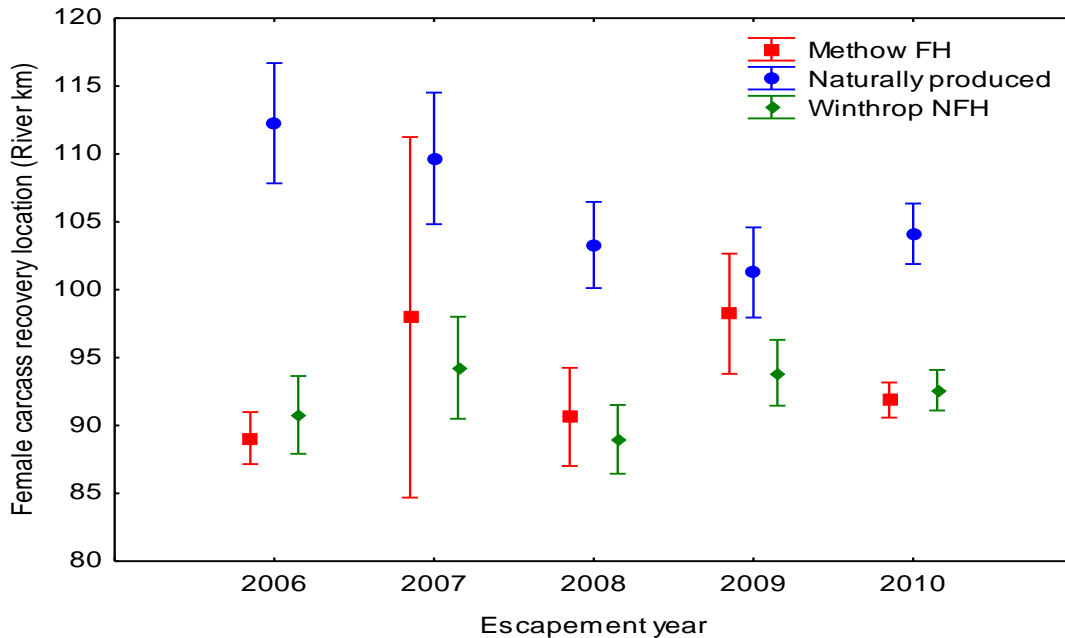


Figure 1. Mean spawner distribution based on carcass recovery of hatchery and natural origin spring Chinook in the Methow River (Murdoch et al., 2011)

The skewed spawning distribution along with high densities of hatchery fish may be a contributing factor to the low productivity observed in the Methow River. We believe that the difference in spawner distribution can be directly attributed to hatchery spring Chinook imprinting and homing to Winthrop NFH (Rkm 81) and Methow FH (Rkm 85) from which the fish are reared and released.

The fundamental assumption behind the theory of supplementation is that hatchery fish returning to the spawning grounds are 'reproductively similar' to naturally produced fish; inherent in the supplementation strategy is that hatchery and naturally produced fish are intended to spawn together and in similar locations. If supplemented fish are not fully integrated into the naturally produced spawning population, the goals of supplementation may not be achieved (Hays et al., 2007). For a supplementation program to be effective, hatchery origin fish must spawn with natural origin fish. Despite reduction in release numbers of spring

Chinook and steelhead released from CCPUD, DCPUD, and GCPUD supplementation programs (in 2014) we have no reason to expect that this decrease will alter the hatchery origin spawner distribution. We believe that if Objective 2 or 5 are not currently met, it is unlikely that they will be achieved in the future unless changes to the acclimation release strategy are made.

Additionally it is anticipated that adult management will occur in the near future, limiting the proportion of hatchery origin fish on the spawning grounds. To make effective use of these few resulting spawners, it is critical to ensure that the Project is operated with the vision of fully integrated populations. Acclimated hatchery fish could be marked in a manner that could facilitate identification and removal at Wells Dam if necessary (i.e. PIT Tags, blank adipose wire, etc). It is also likely that some portion of the fish acclimated under this program may still be attracted back to the hatchery from which they were reared and could be removed.

To encourage some hatchery origin spawners to migrate farther upstream, we are proposing to acclimate (spring only) 15,000 Chinook pre-smolts at YN's Goat Wall acclimation site (*see section 3 for a description of acclimation sites*) and 46,000 at Mid-Valley Pond (formerly called Heath Pond ; Table 1). The sum of 61,000 would represent Chelan PUDs spring Chinook obligation in the Methow River starting in 2015.

Other sites or locations may be considered in the future as additional ponds are developed. As part of this Project, spring Chinook may be acclimated as the sole species in a pond or could be co-mingled with coho salmon or steelhead.

Table 1. Proposed Acclimation Locations and Numbers

Basin	Acclimation Site	Species	Release Year to Start	Number of Juveniles	Target FPP at transport	Marking Plan	Number of Juveniles PIT tagged
Methow	Goat Wall	Spring Chinook	2015	15,000	18-20	TBD	TBD
	Mid-Valley	Spring Chinook	2015	46,000	18-20	TBD	TBD
	Blue Buck	Steelhead (WNFH)	2014	25,000	12-15	TBD	TBD
Wenatchee	Rolfing Pond	Coho (Mid-Columbia Coho Restoration project)	Ongoing	90,000	21-23	100% CWTed + ad-pres + Body tag	6,000
		Steelhead (Eastbank FH, WxW)	Ongoing	20,000	15-17	TBD	TBD

2.2 Methow Spring Chinook (Chewuch Release)

Spring Chinook released from the Chewuch Acclimation facility have a similar spawning distribution as the naturally produced spring Chinook spawning in the Chewuch River. Because the rearing facility (Methow FH) is not located within the Chewuch River, those fish which home successfully back to the Chewuch have no analogous facility to potentially alter their spawning distribution (the Chewuch Acclimation Pond is not operating during the adult return and spawning time frame).

However, it is apparent that attraction back to the Methow Fish Hatchery still occurs and is an important factor resulting in lost homing fidelity (43% of Chewuch acclimated and released fish home back to the upper Methow River rather than the Chewuch River) and likely further contributes to the skewed spawner densities observed in Figure 1.

To improve homing fidelity and efficacy of supplementation in the Chewuch River, in the future we recommend over-winter acclimation for all spring Chinook released in the Chewuch River. Currently, YN's Expanded Acclimation program does not have any overwinter acclimation capability in the Chewuch River but if developed may seek a 6-month rearing/acclimation timeframe for spring Chinook at a later date.

2.3 Methow Spring Chinook (Twisp Release)

We are not proposing any Expanded Acclimation sites for Twisp River spring Chinook at this time.

2.4 Methow Steelhead (WNFH; 2014 & 2015)

Winthrop National Fish Hatchery is currently evaluating a two-year steelhead smolt conservation program. Currently the steelhead program at WNFH is operated as a single point release site which we believe is inconsistent with the premise of supplementing natural spawning populations. Single point release sites from a hatchery promote a concrete to concrete program with little opportunity to truly integrate hatchery released fish into naturally spawning population. A single point release from a hatchery conflicts with the “gravel-to-gravel” approach to the management of salmon promoted by the Columbia River treaty tribes (CRITFC 1995).

Through agreement of the US v OR parties, as the WNFH steelhead program transitions to a 200k conservation program, steelhead are intended to be released into habitat areas including the Upper Methow and Chewuch or other locations.

In the long term we expect that this Project will play an important role in helping to fully integrate the WNFH steelhead program. In the short term (2014 and 2015) 25,000 steelhead smolts from WNFH will be available for release into habitat areas under YN’s Expanded Acclimation program. For 2014, we are proposing acclimating steelhead in Beaver Creek at the Blue Buck (formerly called Parmley Pond) acclimation site. In future years, as more steelhead from the WNFH program become part of this Project, other release sites including sites on the Chewuch River, Upper Methow River or Gold Creek may be considered. As part of this Project, Steelhead may be acclimated as the sole species in a pond or could be co-mingled with spring Chinook salmon or coho.

Similar to Methow spring Chinook, it is anticipated that adult management will occur in the near future, limiting the proportion of hatchery origin fish on the spawning grounds, therefore we believe it is critical to ensure that the program is operated to make effective use of these few spawners. Should adult management be required, excess hatchery origin fish could be removed through fisheries or at Wells Dam.

2.5 Wenatchee Spring Chinook (Chiwawa Release)

Similar to the Upper Methow, the spawning distribution of hatchery and natural origin spawners in the Chiwawa are not the same (Figure 2; Hillman et. al, 2011). Hatchery spawners disproportionally spawn in the lower two reaches of the river with fewer upstream spawners. This skewed distribution is likely due to the location of the Chiwawa Acclimation Ponds.

Early results from an ongoing reproductive success study in the Wenatchee Basin indicate that the spawning distribution negatively affects the success of the hatchery spawners. Ford et. al (2011) reported that Spawning location within the (Chiwawa) river had a significant effect on fitness for both males and females, and for females explained most of the reduced fitness observed for hatchery fish in this population.

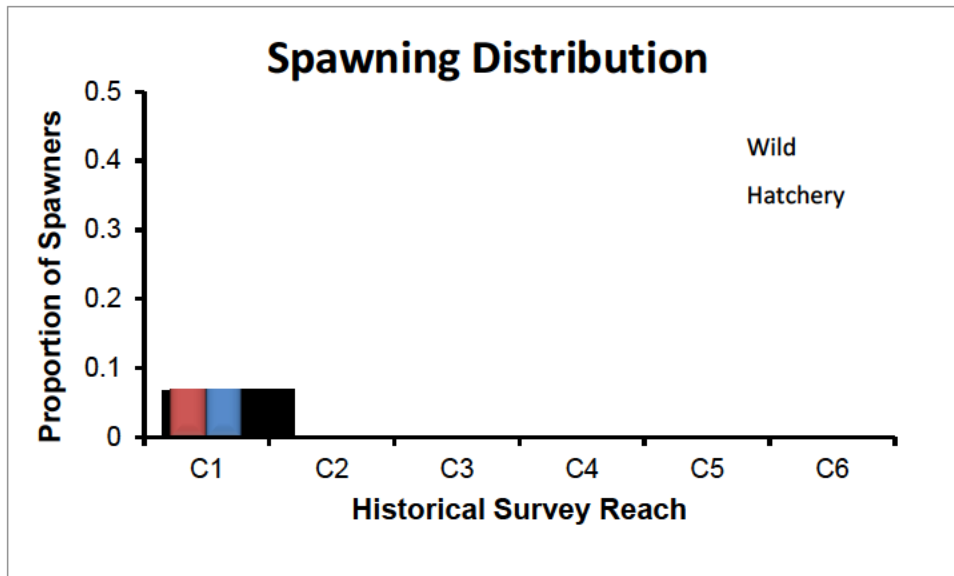


Figure 2. Hatchery and wild Chinook spawning distribution in the Chiwawa River (Hillman et al., 2011)

We are currently working on developing an acclimation site in the upper reaches of the Chiwawa River. Should this acclimation site prove to be a viable alternative we will likely propose acclimating a some proportion (to be determine based on site specifications) further upstream to improve the effectiveness of the Chiwawa River supplementation program.

2.6 Wenatchee Steelhead (2014 and beyond).

We are proposing to continue to acclimate and release Wenatchee River summer steelhead (reared at the WDFW/CPUD Chiwawa Facility) into Nason Creek. For the short term (2014 & 2015) we plan to continue to acclimate approximately 25,000 steelhead pre-smolts from the Roling’s Pond Acclimation site. However, as additional sites become developed we may seek to increase the number of steelhead acclimated at various locations under this Project. As part of this Project, Steelhead may be acclimated as the sole species in a pond or could be co-mingled with coho salmon.

3. Site Descriptions:

3.1 Goat Wall

The Goat Wall acclimation site is a disconnected side channel system on the upper Methow River, located near of the mouth of the Lost River (rkm 112) . There is a pond at the downstream end of a disconnected side channel. The pond is fed by both surface water and ground water. Surface water is provided by a diversion on the adjacent Gate Creek and ground water is supplied by Cold Creek (a groundwater seep).

One of our smaller ponds, the Goat Wall pond has a volume of approximately 7,000 cu.ft. with a flow rate of approximately 1.11 cfs. Based on the flow capacity we estimate the pond could hold up to 34,000 spring Chinook (0.75 FI; 0.06 DI).

3.2 Mid-Valley

A series of large springs originate in the Methow valley floor; ponds have previously been constructed in the past to impound the spring water for irrigation purposes. Habitat restoration efforts are currently underway to provide fish passage into and past the ponds. The pond proposed for acclimation is the most downstream in the springs complex. The site is located at rkm (87) and is downstream of the section of Methow that annually dewater. The pond measures approximately 450' x 70'. A temporary seine system would allow passage by other fish species in the spring system. The adjacent upstream property is WDFW's Big Valley Unit of the Methow Wildlife Area and is managed for riparian habitat protection and wildlife conservation. Based on the flow and volume we could acclimate up to 122,650 spring Chinook.

3.3 Blue Buck

Blue Buck (formerly called Parmely Pond) is a farm pond that was previously constructed and is adjacent to Beaver Creek (Methow Basin). It is fed by Beaver Creek via a diversion. The Blue Buck pond has a flow rate of (900 gpm) and capacity of 9400 cu. ft. We expect that we could rear up to 63,000 steelhead within this pond.

3.4 Rolfing's Pond

Rolfing's Pond is currently being used for both the Coho Restoration Project and the Expanded Acclimation Project. Rolfing's Pond is located on an unnamed seasonal creek which feeds in to Nason Creek (off of Whitepine Rd). This season creek flows directly into the man-made pond proving approx 2 cfs of water during the spring months. Additionally there is a groundwater supply consisting of an 8" well which was dug in 2003 and estimated to produce 130 gpm. Piping and a degassing tower were recently installed and could allow for this water supply to be used for overwinter acclimation.

The existing pond was expanded in 2004 and again in 2009. It now measures approximately 90' long by 50' wide with an average depth of 6 ft. A barrier net at the pond outlet is installed during the acclimation period to prevent premature downstream migration.

With a volume of 7000 cu. ft and approx 2 cfs of surface water we expect that up to 75,000 steelhead.

4. Literature Cited

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