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# Upper Columbia River Steelhead Kelt Reconditioning Program: Annual Report 2010/2011

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Matthew Abrahamse
Keely Murdoch

Yakama Nation Fisheries
Toppenish, WA

## Introduction

Upper Columbia River (UCR) steelhead are listed as "Endangered" under the ESA, and naturally-spawning populations currently exist at threshold levels. Unlike other species of Pacific salmon, anadromous steelhead are iteroparous. However, rates of iteroparity for UCR populations are extremely low, likely due to high mortality imposed by such factors as extreme energetic demand, degraded habitat quality, and post-spawning migration through the Columbia River hydropower system.

The Yakama Nation (YN) seeks to implement a kelt reconditioning program within the Upper Columbia consistent with FCRPS BiOp requirements and the Columbia Basin Anadromous Fish Accords. The goal of this program is to increase the abundance of naturally-produced UCR steelhead on natural spawning grounds by as much as 10 percent through the use of kelt reconditioning. The program has three objectives:

(1.) Implement a kelt reconditioning program in the UCR to increase natural origin steelhead abundance relative to current conditions,
(2.) Evaluate kelt survival and program effectiveness, and
(3.) Collaborate with ongoing M&E studies to document the reproductive success of kelts released from the reconditioning program.

The work performed under 2010/2011 contract was critical to the development and implementation of a kelt reconditioning program in the upper Columbia River. Work completed included the site selection and design development for the reconditioning facility, determining means for kelt collection, hiring and training of a kelt reconditioning biologist, and pre-acquisition activities for the Dryden property. These achievements have set the stage for the advancement of the program in the future.

## Kelt Reconditioning Facility

The selection of a site to construct a reconditioning facility was a pivotal step in the implementation of the kelt reconditioning program. Several locations were considered, including a site near Dryden, Washington and Entiat National Fish Hatchery. During 2010, a tentative agreement was made with the US Fish and Wildlife Service (USFWS) to allow the facility to be built at Winthrop National Fish Hatchery in Winthrop, Washington. The selection of a location allowed the project to proceed with the development of the facility design.

Sea Springs Co. was contracted to produce the conceptual facility designs. During concept development, the facility was named the Winthrop Steelhead Isolation Facility (WSIF). The name was chosen because the facility may include early rearing of steelhead progeny to accommodate live spawning and reconditioning of natural origin broodstock. The name emphasizes the goal of biosecurity, which is critical to facility operation.

Yakama Nation (YN) worked closely with Sea Springs Co. in designing the WSIF. During the design process, several drafts were reviewed and commented on by the YN. A final draft was completed in December 2010 and provided to USFWS personnel for review. We are currently incorporating USFWS comments into a revised conceptual design.

The construction of the WSIF is scheduled to begin in late August 2011. The goal is to be ready to house steelhead kelts beginning March 2012. The WSIF will be housed in a 27 ft by 85 ft pre-engineered steel building. The facility will have four circular kelt tanks, each with a diameter of 12 ft and a volume of 340 cubic feet (cft). The facility will be able to house a maximum of 136 steelhead kelts. The facility will also have 10 rearing troughs 24 ft wide by 96 ft long and 27 ft deep with a volume of 36 cft each. The troughs will allow for incubation and initial rearing for the progeny of 10 live spawned steelhead until disease testing can be performed and the progeny returned to the main hatchery building. The water treatment system will use a combination of settling basins to remove particulate matter and UV sterilizers to kill pathogens. The UV sterilizers will be capable of emitting 270,000 microwatts/centimeter squared.

## Live Spawning Study

Determining sources of natural origin (NOR) steelhead kelt is another important step in the development of a reconditioning program. One potential source is NOR steelhead used as broodstock in hatchery conservation programs. Under current hatchery protocol, all broodstock fish are euthanized prior to spawning. The application of live spawning techniques for all NOR fish would allow their inclusion into the reconditioning program.

Meetings were held with Washington Department of Fish and Wildlife (WDFW), Chelan County Public Utility District (CPUD), Douglas County Public Utility District (DPUD), and USFWS to discuss live spawning of NOR broodstock. To address concerns that live-spawning could result in a reduction in the number of viable gametes extracted; we developed a study plan to measure any differences in the numbers of gametes extracted and to determine any changes to gamete quality or survival. The study will be implemented during the spring of 2011 at Winthrop National Fish Hatchery. Excess hatchery origin returns will be spawned using either air spawning or lethal spawning methods. The quantity of eggs collected using both methods will be compared to determine if a statistically significant difference exists. Egg quantity will be measured by both egg weight and extrapolated egg number.

The eggs collected in the study will be fertilized and incubated until they reach the eyed stage. The number of males used for fertilization will be limited to reduce some of the variability in the fertilization rates among test groups. Two females, one from each treatment group, will be fertilized by the same two males. Two males will be used to insure fertilization of the eggs if one of the males has non-viable gametes. Eye up rates will be compared among methods to determine if a statistically significant difference exists. Eggs will be disposed of upon completion of the study.

Results of the study will be used to determine if natural origin steelhead collected as broodstock for Upper Columbia hatchery programs could be live-spawned, reconditioned and released rather than

lethally spawned. If the study demonstrates that live spawning does not negatively impact the number of eggs collected, hatchery broodstock could become an important source of kelts for the reconditioning program.

## Twisp Weir Trap

Steelhead that spawn naturally in the wild are another source of NOR kelts. These kelts are often observed moving downstream of traps designed to capture and enumerate steelhead migrating upstream. The weir owned by DPUD and operated by WDFW on the Twisp River is a site where kelts are commonly observed. During 2010, the YN sought to develop a method to collect kelts moving downstream over the Twisp River weir. Careful planning was necessary to develop a kelt collection method that would not harm the existing weir panels and trap boxes.

Renegade Metal Craft was contracted to design a prototype for use at the Twisp River weir. A trap box designed to float downstream of the weir panels was determined to be the best alternative for capturing kelts. The trap box consisted of an exterior wood frame (8 ft long, 26 inches wide and 12 inches deep), Vexar mesh to provide a protective barrier for the fish, and squares of foam on the bottom and sides for floatation. The downstream side of the trap box is designed to be opened to release non-target fish species and any accumulated debris. The trap box will be held in place behind the weir panels by ropes anchored to bolts installed into the concrete weir apron. Anchors attached to each end of the trap box will provide lateral stability and allow it to be maintained in the river cross section. The trap box will be operated at the standard weir panel heights. Normal weir trap function will not be hindered by the kelt trap operation or access.

A study plan was developed in 2010 to assess the prototype trap's effectiveness in capturing kelts at the Twisp River weir. The Yakama Nation will conduct this study from April 4 to May 28 2011. This time frame covers the expected peak kelt migration times as well as a wide range of river discharge levels. In addition, an attempt will be made to sample a full 24 hr period each week. By doing this we hope to learn how the date of sampling, river discharge, and time of day influence the rate of kelt capture at the Twisp River weir.

Special care will be taken to minimize the impact of the study on all fish species. The trap will be checked frequently during operation and will not be left unattended. Fish handling will be restricted to the minimum amount required to identify steelhead life history stage. When non-target species are caught in the trap they will be allowed to swim out of the box through the open back panel without handling.

An agreement was made with the DPUD biologists that the trap would not be installed until certain steps were taken. These steps included: getting approval from NOAA fisheries for trap design and sampling methodology, getting ESA coverage from NOAA for "take" of steelhead, getting ESA coverage from the USFWS for "take" of bull trout, and the submission of a formal letter demonstrating the completion of the required steps. The steps have been addressed and we are currently waiting on the

issuance of the ESA permits so that the formal letter can be submitted and installation of the trap may proceed.

## Kelt Reconditioning Biologist

As the program developed there became a need to hire a biologist whose sole focus was kelt reconditioning activities. Matt Abrahamse was hired September 16, 2010 as the Upper Columbia River Kelt Reconditioning biologist. During the five months Matt was employed under this contract he received training and education necessary for him to perform the duties required for this project. He reviewed literature pertaining to kelt reconditioning methodologies as well as background information on the steelhead populations and the Upper Columbia River watershed. He also made contact with biologists from other kelt reconditioning programs to discuss facility design, reconditioning methods, and kelt collection techniques. Matt visited kelt reconditioning programs at Prosser Hatchery and Dworshak National Fish Hatchery to take part kelt related activities and to learn important techniques. Matt's training will continue into the next contract period. He will visit more reconditioning facilities and take part in other phases of the reconditioning process.

## Dryden Property Pre-Acquisition

The process of acquiring the Dryden property proved to be more complicated than was originally anticipated at the beginning of the 2010/2011 contract. There are numerous stakeholders that must be addressed and talks are currently underway. Stakeholders included in these discussions were YN, WDFW, Washington Department of Transportation (WSDOT), Washington Department of Ecology (WSDOE), Bonneville Power Administration (BPA), Chelan County Public Utility District (CCPUD) and several local recreational groups. To further complicate the situation, the property is contaminated with lead. Steps are being taken by YN, BPA, and WSDOE to determine the extent of site contamination through the phase I, II and Remedial Investigation Feasibility Study (RIFS). Findings and associated clean up costs for the Dryden pit site would be negotiated at final sale, if agreeable to all parties.

Some steps forward were taken under the 2010/2011 period. A meeting on December 2 was held with stakeholders to identify key issues that needed to be resolve before moving towards a potential sale. In addition to the lead contamination discussed above, several other issues still exist. These include agreeing on a boundary survey with line adjustments if needed, conducting an appraisal by an independent contractor (yet to be determined), plat partitioning and zoning requirements needed for YN and WDFW proposed parcels, developing transaction language within a sales contract that would comply with legislative language and be agreeable to WSDOT,YN, and WDFW, identifying easements within the property and working with CCPUD to ensure project plans would comply, and submission and securing water rights. A boundary survey and multiple water surveys were completed. A legal description of the property was also completed but still trying to identify and resolve discrepancies between the multiple surveys conducted on the property. The appraisal process has begun with YN submitting bid packages to prospective contractors suited to effectively evaluate the site. The appraisal will be two part; a price of the collective whole and individual parcels identified in the approved site

map.  Completion of the other work elements described in the contract statement of work will have to be postponed until all stakeholders can be appeased and the lead contamination issues are resolved. These issues will be updated at the next meeting tentatively scheduled for mid to late March, 2011.