FY2013 ANNUAL REPORT

MARCH 1, 2013 THROUGH FEBRUARY 28, 2014

YAKAMA RESERVATION WATERSHEDS PROJECT

BPA Project #1996-035-01-Contract #35636

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Introduction

A. Project Overview

In June of 2005, the Ahtanum Watershed Assessment, Toppenish Watershed and Satus Watershed Projects were combined into one project, named the Yakama Reservation Watersheds Project (YRWP). Since the last report in 2012, YRWP staff have continued several tasks including close monitoring of stream discharge and irrigation withdrawals, monitoring of juvenile steelhead outmigration, steelhead spawning surveys, and analysis of irrigation extent and timing. We have also continued our restoration efforts in the three watersheds, completing two culvert removal projects and an engineering plan to stabilize an eroding bank during the 2013 work season.

III. Restoration Projects

A. Simcoe Creek Bank Stabilization and Fish Habitat Enhancement Project

Overview:

The project site is located in White Swan, WA on Simcoe Creek. Simcoe Creek is used by ESA listed Middle Columbia River Steelhead Trout during freshwater life history stages. Steelhead productivity in the form of redds have been documented throughout Simcoe Creek and its tributaries. The right bank of Simcoe Creek at the project site has significantly eroded since 1996. The intent of this project is to evaluate the geomorphic processes causing bank erosion, develop feasible alternatives to provide bank erosion protection, establish woody riparian vegetation, provide aquatic habitats and establish sustainable geomorphic processes and function. Target habitats included adult steelhead staging habitat and juvenile steelhead rearing/forage habitat.

Figure 1. Looking upstream at eroding bank, March 2012

Methods:

A site survey and alternatives analysis was conducted to develop a concept design to stabilize Simcoe Creek. The alternatives analysis utilized data collected from the site investigation to develop feasible alternatives for stabilizing the project site. Concept designs and planning-level cost estimates were developed for each alternative. The preferred alternative was developed to a design-bid-build level of completion that included hydraulic model design conditions, design features and details to provide desired bank stability and aquatic habitat, large wood stability and scour analysis, and planting zones and desired species were identified.

Results:

Design conditions included reconstructing the stream bank by adding a rip rap toe, large woody debris, and general fill. However, moving the toe of the existing stream bank does not meet BPA's Habitat Improvement Programmatic (HIP) BiOp with National Fisheries Marine Service (NMFS) criteria to permit this project under the Endangered Species Act (ESA). The project was re-designed so that the toe of the slope does not change, basically eliminating riprap and general fill material. This essentially was not approved for implementation due to liability and safety concerns with the adjacent landowner.

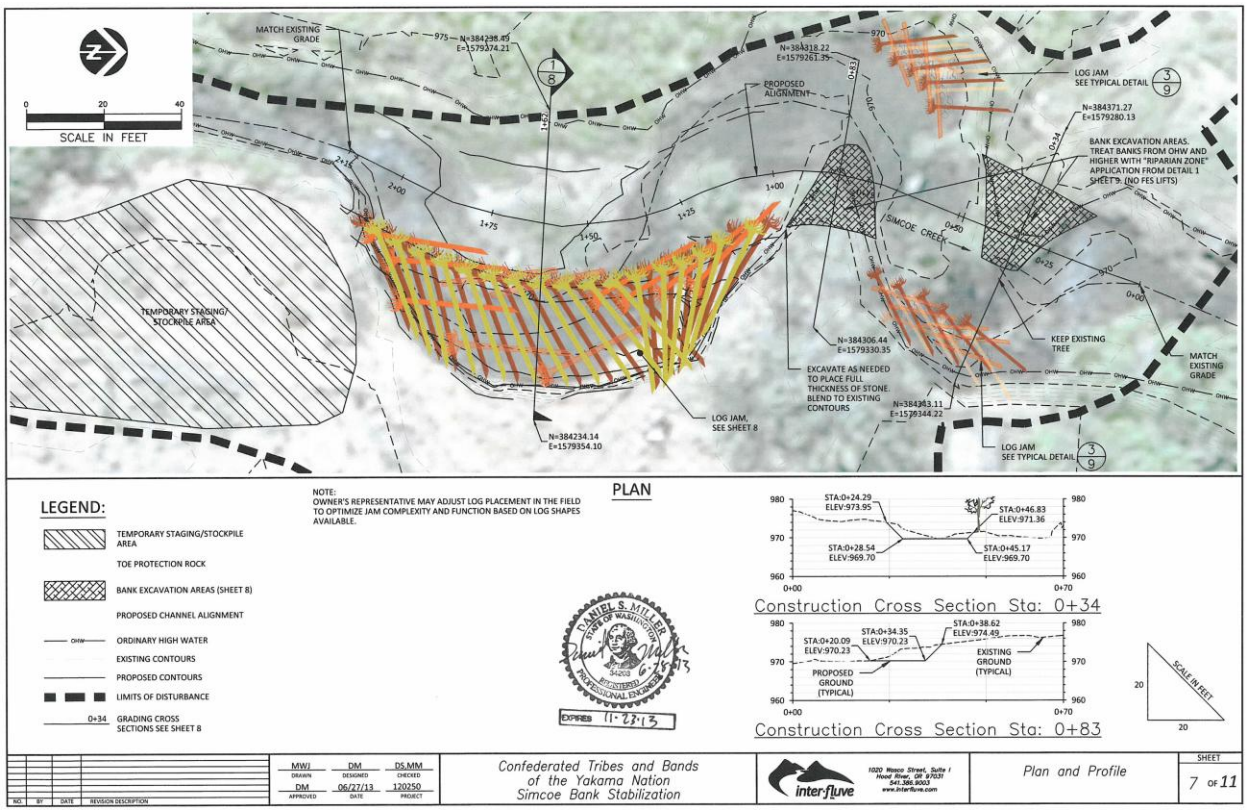

Figure 2. Re-design to meet BPA's HIP BiOp criteria for ESA consultation

B. Upper Toppenish Creek Culvert Removal & Ford Installation Project

Overview:

An inoperable culvert (figure 3) was identified in Upper Toppenish Creek near the Toppenish Creek headwaters, Lincoln Meadows. The culvert was clogged at the intake and the creek had avulsed around the culvert. As a result; the road was no longer drivable, fish passage had been blocked and excessive sedimentation was impacting salmonid habitat. Toppenish creek provides habitat for Middle Columbia River Steelhead and Westslope Cutthroat Trout which are among the fish species that are believed to benefit from this project. In the fall of 2013 YRWP staff worked with Yakama Nation Wildlife staff to remove the culvert and install an armored ford in its place. YRWP staff conducted a topographic survey of the site prior to the project implementation to characterize the slope and boundary conditions to aid in the design of the ford that replaced the inoperable culvert (figure 4).

Figure 3. Inoperable culvert at channel crossing prior to implementation. Note: 2’ drop at culvert outlet

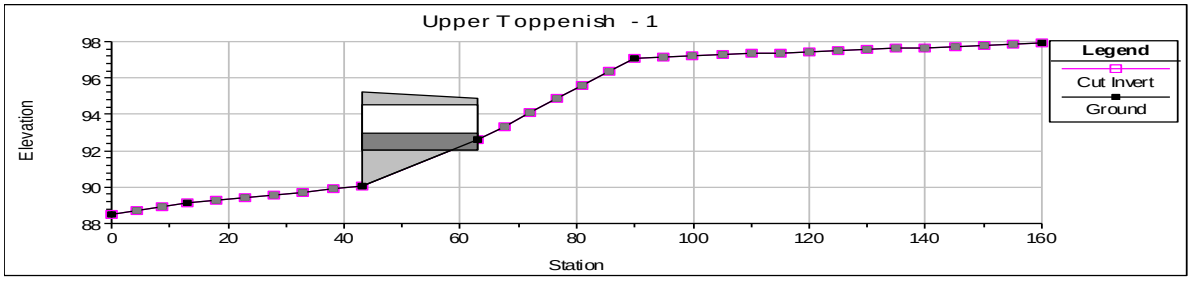

Figure 4. Model of pre-treatment site condition. The gray areas indicate fill to be removed. The dark gray portion indicates the area of the culvert that was plugged with fill.

Methods:

Using the results of the topographic survey as a guide, the longitudinal slope of the ford was designed to provide grade control while also facilitating natural sediment transport levels and unimpeded fish passage. The downstream extent of the ford meets the existing bed elevation

which is predominantly large cobble. The slopes into the newly formed channel allow for four wheel drive vehicle access. The cut areas were excavated one foot deeper than the finished grade, then filled with appropriately sized rock (existing particle size downstream of culvert were matched) sourced from a quarry less than one mile from the site. Following construction activities, the site was replanted with native riparian and upland seed and plants by Fisheries staff (figure 6).

Figure 5. Fish barrier culvert removed.

Results:

The inoperable culvert was removed (figure 5), and the ford was installed to the design specifications on October 31, 2013 (see figure 6).

Figure 6. Site condition immediately following construction and revegetation efforts (flow is now perennial through the ford).

C. South Fork Ahtanum Creek Culvert Removal & Forest Road Improvement

Project Overview

Yakama Nation Fisheries identified a site to restore to benefit Middle Columbia River Steelhead ESU and other ESA listed fish species. An improperly placed and designed logging road was diverting surface water and an ephemeral stream, causing excessive sedimentation and downstream temperature increases in South Fork Ahtanum Creek. A culvert was completely inundated with sediment and debris at the junction of two logging roads which caused the stream alignment to shift from its former channel onto the road where it flowed for approximately ¼ mile before reentering the former channel (figure 7). Surface water runoff and spring derived water sources were being captured by the roadway further down the road as well. The goals of the project were to restore the ephemeral tributary channel alignment and divert surface water sources into the ephemeral tributary closer to their source.

To efficiently achieve these goals, YRWP staff removed the dysfunctional culvert and installed a ford in its place, reshaped the roadway, and added eight water bars along the roadway in strategic locations. To gain a better understanding of the site and existing topography, YRWP staff performed a simple topographic survey of the channel and adjacent roadway upstream and downstream of the culvert.

Figure 7. Roadway capturing stream channel pre-treatment.

Methods

The ford site was excavated ~ 1 foot below the proposed finished grade (pink line in figure 8) then filled with rock with rock sourced from the site. Approximately 83 cubic yards of material was excavated to reach the grade of the finished surface elevation of the ford. 79 additional cubic yards of material was removed to reach the sub grade of the ford. Extra fill material was used for reshaping of the road portion of the project. The slope through the ford area was designed at a 20% slope. The accent and descent into the stream channel is an approximate 2:1 slope to allow four wheel drive vehicle access. The site was planted with native riparian and upland seed mix and plants immediately following construction.

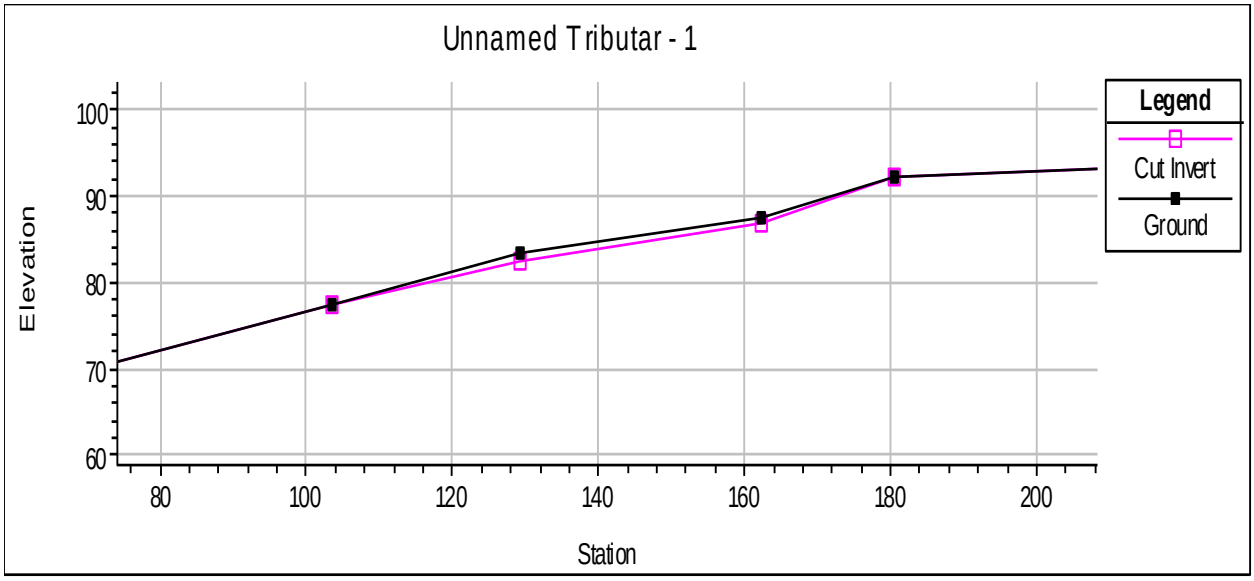

Figure 8. Longitudinal profile of the stream channel

Results

The culvert was removed and the ford was shaped in its place. The degraded roadway was reshaped and 8 water bars were installed to allow the roadway to drain directly back to the ephemeral channel. At the extreme downstream extent of the project, the spring, which was formerly flowing down the roadway for ~1/4 mile, was diverted directly to the riparian area adjacent to the ephemeral stream with one of the eight water bars. These actions are hypothesized to improve downstream water temperatures and decrease sedimentation onto spawning habitat. A temperature data logger is collecting water temperature data at the confluence of the ephemeral stream which will provide insight into the success of the project in meeting the objectives to improve water quality for ESA listed fish species in the Ahtanum Creek Watershed.

III. Operations and Maintenance

A. Stock Wells

YRWP staff repair and maintain 33 solar powered stock pumps (Figure 9) and 3 stock water pipelines in the Ahtanum and Toppenish Watersheds. These pumps and pipelines are used to provide stock water when YN minimum instream flow criteria mandate the cessation of irrigation. It is necessary to have many wells because there are many individual cattle operations, several of which may not always be served by a single well. Operating these wells has been a difficult task which we are still in the process of perfecting. Project staff anticipates

constructing more stock pipelines that will be associated with the existing stock pumps. This will better meet multiple users' needs while only using one stock pump.

Figure 9. Stock pump and watering trough.

Routine maintenance of these facilities includes fixing a significant amount of broken PVC plumbing (often associated with cattle damage), replacing the electrical pieces of the pump's control systems as they wear out and upgrading the water troughs associated with the pumps.

Project staff have found that most of the infrastructure associated with the watering troughs (hoses, float switches, trough supports etc.) were too lightly built. Over the last year we have been working to upgrade this infrastructure with more rugged float switches, flexible PVC hoses instead of garden-type hoses, more sturdy stanchions for the troughs and gravel aprons around the troughs to prevent soil erosion.

In addition we have found it necessary to replace several of the protective fences surrounding the installations. The original fences were usually standard barbed wire and it has become apparent that a post and pole type fence is more appropriate for this application.

We have experienced relatively few problems with the solar arrays associated with the pumps. Several arrays have been upgraded to provide more power and thus more pumping capacity to units that experience high demand.

B. Fencing

As in past years, staff maintained over 158 miles of range unit boundary fence, 15 miles of riparian fence and 22 miles of meadow exclosure fence. The YRWP maintains range unit boundary fence in places where those fences keep cattle out of sensitive areas. Staff build and maintain riparian fencing. Some of the maintenance is done in cooperation with the Bureau of Indian Affairs' Range Program, however that program is chronically understaffed, and much of the work falls to the YRWP.