



FY2017 ANNUAL REPORT

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YAKAMA RESERVATION WATERSHEDS PROJECT

BPA Project #1996-035-01-Contract #56662 REL 127

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Starvation Flats restoration project completed September 2017. Photo taken via drone courtesy of Interfluve, Inc.

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Table of Contents

INTRODUCTION:	3
Project Overview	5
RESTORATION PROJECTS	6
A. Starvation Flats.....	6
FENCING:.....	9
A. Lakebeds fence:.....	9
ENGINEERING:.....	10
A. Toppenish Creek River Mile 40 Project	10
HABITAT ASSESSMENT:.....	11
A. Simcoe Creek Reach Assessment	11
REFERENCES	14

List of Figures

Figure 1. Photo depicts reach of stream channel within Starvation Flats meadow complex that was restored during the 2017 field season.	7
Figure 2. Image depicts restoration work post implementation at Starvation Flats meadow pond and plug project site (8-23-17 to 9-1-17) Structures and site layout pictured in images above were designed by Interfluve, Inc.	8
Figure 3. Image depicts meadow and approximate area that fence was constructed during the fall of 2017.	9
Figure 4. Blue line on map depicts area where the Simcoe Creek reach assessment was conducted. Habitat conditions and potential project identification were assessed during the survey of Simcoe Creek and a final report generated in 2017.	12

List of Tables

Table 1. Names and linear distances of exclosure fence constructed at various sites on the Yakama Reservation. YRWP staff regularly maintains all fences in these locations to try to prevent damage from livestock and motorized vehicles.....	10
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Introduction:

Project Overview

The YRWP conducts comprehensive watershed restoration activities including (1) headwater wetland rehabilitation; (2) adult and juvenile fish passage restoration; (3) stream channel and riparian area restoration including bringing stream channels back to grade, reconnecting side channels and floodplains, planting native vegetation in conjunction with riparian and range fencing; (4) minimum instream flow implementation and modification of irrigation water sources and uses; along with (5) physical monitoring that includes precipitation, groundwater, discharge from streams, canals and drains, temperature, water quality, fish habitat structure and quality according to accepted protocols; and (6) biological monitoring including spawning ground surveys, snorkel surveys and smolt trapping. Stream channel, floodplain and vegetation restoration projects addressing habitat related limiting factors (i.e., flow, key habitat quantity, habitat diversity, temperature, sediment load, channel stability) that were identified in the Yakima Subbasin Plan Supplement (2004, pp. 11-13) form the core of our project. The ultimate goal of the project is to restore the natural hydrologic function of the watersheds as much as possible without causing an overwhelming burden to economic interests (i.e., timber harvest, agriculture) on the reservation. This in turn will increase steelhead spawning success and juvenile survival to outmigration. In addition to steelhead, restoration work will likely benefit other anadromous and resident fish species (e.g., coho salmon, chinook salmon, bull trout, and westslope cutthroat trout) and many wildlife species as well. The Satus, Toppenish and Ahtanum watersheds are home to approximately half the total spawning abundance—and two of the four distinct populations—of Yakima Subbasin steelhead. Currently, these watersheds are habitat limited for a variety of reasons. As in other areas in the Columbia River basin, anadromous fish stocks have declined drastically in these three Yakima River tributaries. Some estimates place the adult steelhead returns to the Yakima Subbasin at ten percent of historical levels (Yakima Subbasin Plan Supplement 2004, p. 8). In March 1999, Middle Columbia River steelhead were listed as threatened under the Endangered Species Act. The importance and cultural significance of steelhead to the Yakama Nation, their status as a threatened species under the Endangered Species Act, and the critical role of Yakama Reservation steelhead populations in steelhead recovery are our rationale for making steelhead the primary focal species of the Yakama Reservation Watersheds Project (YRWP). In 2005, the three primary watersheds (Satus, Toppenish and Ahtanum) were combined to be monitored and restored under The Yakama Reservation Watersheds Project (YRWP). Since the last report in 2016, YRWP staff has continued several tasks including; close monitoring of stream discharge and irrigation withdrawals, monitoring of juvenile steelhead and coho outmigration, steelhead spawning surveys, and analysis of irrigation extent and timing. We have also continued our restoration efforts in these three watersheds, completing a meadow restoration project (Starvation Flats), meadow protection fencing, and engineer design for the Toppenish Creek River Mile 40 restoration project.

Restoration Projects

A. Starvation Flats

Background and Location:

The Yakama Nation Fisheries Program (YNFP) identified Starvation Flats, the headwaters of dry creek as a candidate location for habitat and meadow restoration (Figure 1). Dry creek is a tributary to Satus Creek and ultimately the Yakima River, and is utilized by ESA listed middle Columbia River steelhead (*Oncorhynchus mykiss*) during multiple freshwater life history stages. *Oncorhynchus mykiss* exhibit complex life history traits and are capable of multiple spawning years whether anadromous (Steelhead) or freshwater residents (rainbow trout). The middle Columbia River steelhead (steelhead) population is considered to be an evolutionary significant unit comprised of a distinct population segment; meeting specific physical, behavioral, and genetic criteria laid-out in the ESA (NMFS 2009).

History:

Spawning and rearing habitat availability in the Satus watershed has been impacted by human land uses, predominantly those related to logging, grazing, and road construction. Direct impacts to habitat include channelization, grade control structures, bank armoring, canals and ditches, increased turbidity and temperature, decreased baseflows and substrate embeddedness (Resseguie 2017). These impacts have resulted in ongoing channel incision, bank instability, floodplain disconnection, meadow drying, wetland losses, and a reduction in riparian cover and function. As a result, high quality off-channel habitat, suitable spawning gravels, and cover for fish are all diminishing in Satus Creek and its headwaters.

Restoration Goals:

The primary objective of this project is to improve the biotic, geomorphic, and hydrologic processes in this portion of Starvation Flats in order to increase local groundwater storage and enhance downstream flow conditions (quantity and quality) in North Fork Dry Creek. The Dry Creek watershed is an important tributary to Satus Creek, which supports the highest redd counts for ESA listed steelhead in the Yakima River Basin (Resseguie 2017).

A secondary objective is to locally restore and support the return of culturally-significant plant foods, such as camas (wak'amu) and yampah (sawikt), in the meadow areas of Starvation Flats. This project was designed to provide conditions conducive for the re-establishment and continued presence of these plant foods in the project area. As a pilot project, the design and performance of this pond and plug project will inform future restoration efforts and help determine the effectiveness of similar projects to reach the restoration goals at the site (Interfluve, 2016).

Pre-Construction Photo:



Figure 1. Photo depicts reach of stream channel within Starvation Flats meadow complex that was restored during the 2017 field season.

Post Construction Project Photos:



Figure 2. Image depicts restoration work post implementation at Starvation Flats meadow pond and plug project site (8-23-17 to 9-1-17) Structures and site layout pictured in images above were designed by Interfluve, Inc.

Fencing:

A. Lakebeds fence:

The Lakebeds fence was completed in the fall of 2017. It is a combination of buck and pole and 4-strand barbed wire. The fence will protect valuable cultural, meadow, and stream resources. The fence was only partially constructed during the summer of 2016 with work stopping due to the size of the meadow and inclement weather conditions.

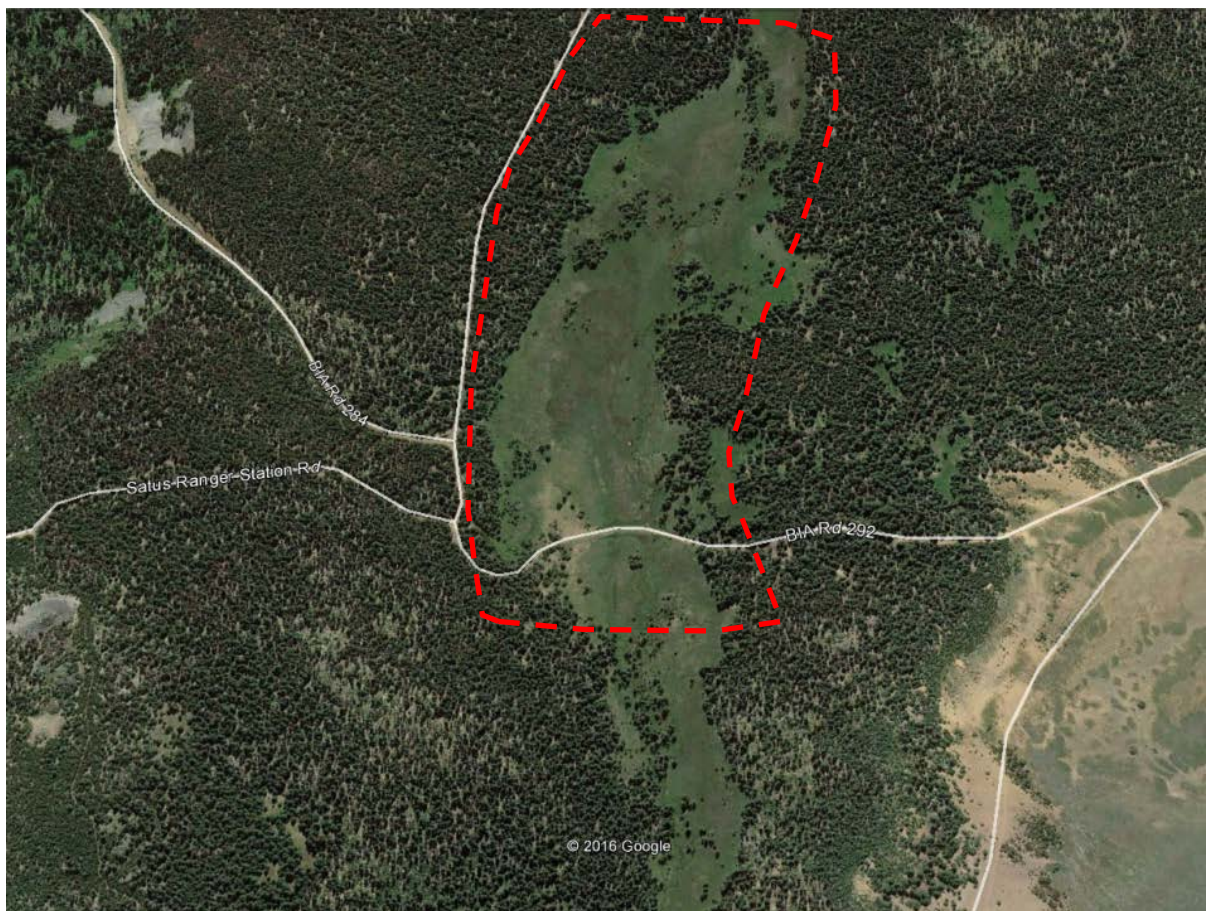


Figure 3. Image depicts meadow and approximate area that fence was constructed during the fall of 2017.

Exclosure fencing reduces grazing impacts and prevents motor vehicle travel in sensitive areas. Headwater meadows and streams are of particular interest due to their ability to store cool clean water that helps augment summer base flows and provide culturally important foods to people of the Yakama Nation. Exclosure fencing allows for increased soil retention at each site, increased function of meadow hydrology and native vegetation establishment. The YRWP

annually maintains approximately 18 kilometers of fence and typically builds 1-2 kilometers per year over the last several years (Table 1). Fencing strategies vary depending on site and site conditions but include standard 4 strand barb-wire as the cheapest alternative and buck and pole fencing which is more expensive but decreases ground disturbance and can be more wildlife friendly.

Table 1. Names and linear distances of exclosure fence constructed at various sites on the Yakama Reservation. YRWP staff regularly maintains all fences in these locations to try to prevent damage from livestock and motorized vehicles.

Name	Length (Miles)	Length (Km)
Camas Patch Barb Wire/ Buck and Pole	6.75	4.05
UpperToppenish	0.74	0.45
Lakebeds	2.68	1.61
Lincoln Meadows	1.06	0.64
Renchlers	1.22	0.73
Toppenish Creek River Mile 37	4.57	2.74
Seattle Springs	0.26	0.16
Seattle Springs	1.79	1.07
Starvation Flats	3.37	2.02
Toppenish Ridge	7.82	4.69
Totals	30.26	18.16

Engineering:

A. Toppenish Creek River Mile 40 Project

Introduction

The conditions at Toppenish Creek along the reach of river mile 40 have been degraded by a history of land use and infrastructure issues. Channel incision and stream bank degradation has occurred as a result of cattle compaction and constrictive bridges on the upstream and downstream end of the project reach. The limitation of the creek to provide flood conveyance results in limitations to the biological production potential of Mid-Columbia river steelhead in this reach. Low summer base flows, high temperatures, lack of instream habitat complexity and quantity have all been identified as possible limitations that will be addressed through restoration efforts.

Site Specifics

The site occurs at the distal end of the alluvial fan along Toppenish Creek. This project will address stream channel confinement by laying back the bank and grading them to a shallower slope. Grade control efforts will promote channel aggradation to encourage out of bank flows in the future. Accessing the floodplain and potential flood conveyance channels will alleviate

pressure from the downstream end of this project reach. Revegetation of the floodplain will occur to promote wood recruitment and increase roughness. The ultimate goal of the action is to increase the quality and quantity of MCRS spawning and rearing habitat and enhanced water quality and quantity.

Project Specifications

Task 1.0 – Site investigation and baseline analysis

Task 2.0 – Alternatives analysis and concept design

Task 3.0 – Draft construction plan

Task 4.0 – Final Construction Plan

Task 5.0 – Project management

An alternatives analysis and concept designs were discussed after the ground survey had taken place and a hydraulic model was run. A restoration strategy will be selected to move the project forward and final designs with a basis of design report will be provided.

Habitat Assessment:

A. Simcoe Creek Reach Assessment

Overview and Location:

Yakama Nation Fisheries, Yakama Nation Reservation Watershed Project (YRWP) conducted the second and final phase of a reach assessment and project identification within the Simcoe Creek Watershed. Project components consisted of:

1. Reach Assessment - Reach and Sub-Unit scale evaluation and project opportunity identification
2. Stream Habitat Assessment - Survey and assessment of stream habitat characteristics
3. REI Metrics - Evaluation of habitat conditions using Reach-Based Ecosystem Indicators (REI)

The project occurred in the Simcoe Creek Watershed from river mile 8.1 near North White Swan Road to river mile 13.9 near the USGS gauging station, within the Yakama Nation Reservation (Figure 4). The reach assessment portion of the project will encompass approximately six miles of Simcoe Creek.

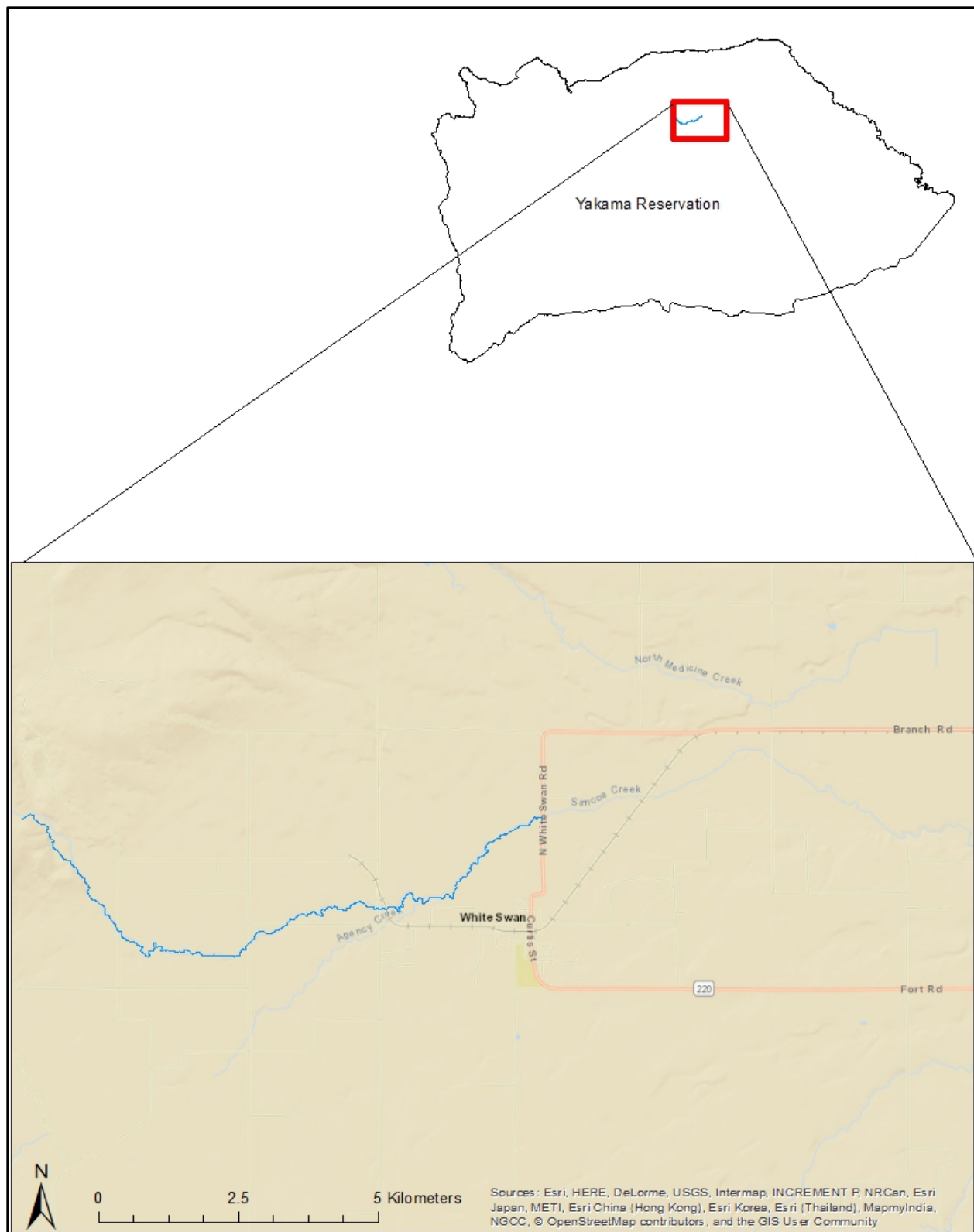


Figure 4. Blue line on map depicts area where the Simcoe Creek reach assessment was conducted. Habitat conditions and potential project identification were assessed during the survey of Simcoe Creek and a final report generated in 2017.

Project Tasks:

Task 4 –Evaluation of Project Opportunities

Habitat enhancement project opportunities were evaluated according to other feasibility and logistical factors, such as landownership and construction access. A decision matrix or similar technique was utilized that allows for the evaluation of projects according to restoration objectives and other evaluation criteria. Criteria to be included in the decision matrix was based upon stakeholder objectives and the findings of the assessments in Tasks 2 and 3 (completed in 2016). Evaluation criteria provided priority to protecting functioning habitat, restoring physical processes, and reconnecting isolated habitats. The matrix included additional criteria such as species addressed, habitat limiting factors addressed, and compatibility with geomorphic setting, costs, feasibility, and risks to infrastructure. The evaluation methodology was prepared and provided for review and comment by YIN and stakeholders as appropriate.

Task 5 – Preliminary Conceptual Designs

A subset (approximately 3 to 5) of the high priority projects moved forward to the conceptual design level. Conceptual designs included a description of existing conditions, project objectives, treatment alternatives, and access/feasibility considerations. An aerial photograph with an overlay of the project area was included. Typical plan, profile, and cross-section drawings of project components were included as appropriate. A planning-level cost estimate was also be provided.

Task 6 –Meetings and Coordination

4 meetings occurred with Yakama Nation Fisheries Staff and others as appropriate. These meetings occurred throughout the scope of the project in order to communicate project status and obtain input from stakeholders / cooperators. Preparation and Power Point presentations for the meetings were carried out. Meetings occurred in the Toppenish area.

This task also included the production of 30 draft copies and 30 final copies (all bound and in color) of the final report for the reach assessments (60 report copies total).

Task 7 – Project Management

Regular communication with YIN staff and reporting of project status occurred. Routine communications with YIN and others as needed to carry out project activities was established.

References

- InterFluve. 2016. Starvation Flats Meadow: Site Assessment & Restoration Strategy. Final report submitted to the Yakama Nation Fisheries Program, February 2016. InterFluve, Inc.
- National Marine Fisheries Service (NMFS). 2009. Middle Columbia River Steelhead distinct population segment ESA recovery plan. National Marine Fisheries Service. Northwest Region. National Oceanographic and Atmospheric Administration. U.S. Department of Commerce.
- Resseguie, Tim. 2017. STEELHEAD (ONCORHYNCHUS MYKISS) POPULATION AND HABITAT MONITORING IN LOWER YAKIMA RIVER TRIBUTARIES, 1/1/2017-12/31/2017 Annual Report, 1996-035-01
- Yakima Subbasin Fish and Wildlife Planning Board. 2004. Management Plan Supplement: Yakima Subbasin Plan, pp. 1-47.