Deep Creek - Starveout Diversion

Fish Passage Project

Adel, Oregon

Final Completion Report

March 4, 2021

Final Completion Summary

The Starveout Diversion Fish Passage Project is located on Deep Creek near the town of Adel in Lake County, Oregon. Deep Creek begins in the Warner Mountains and flows to the east before joining Crump Lake in the Warner Basin. Deep Creek provides spawning and rearing habitat for Warner sucker, Warner Lakes redband trout, tui chub, and speckled dace. Surface water diversions provide irrigation water for basin water users. The Starveout Diversion, located at river mile 4.9, is the second irrigation diversion on Deep Creek. Oregon Department of Fish and Wildlife (ODFW) monitoring results suggested Warner Sucker are blocked by the Starveout Diversion as the species has not been sampled upstream of the diversion.

In 2019, the Warner Basin Aquatic Habitat Partnership (WBAHP) and the Adel Water Improvement District (AWID) coordinated a design to address fish passage and irrigation withdrawal at the Starveout Diversion. A preferred design alternative was selected that included a rock ramp downstream of each of the two diversion weirs where Deep Creek branches into two streams. The rock ramps were constructed to emulate steeper gradient channel segments in the Deep Creek canyon. An equipment access and sediment sluiceway was also be built to facilitate irrigation management. Project implementation began in October of 2020 and concluded by December. In the spring of 2021 a fish passage effectiveness monitoring study will be conducted to ensure the Warner sucker are able to access waters upstream of the newly implemented project. Project success will result in 7 connected miles of stream along Deep Creek.

WBAHP includes the Lake County Umbrella Watershed Council, Lakeview Soil and Water Conservation District, ODFW, U.S. Fish and Wildlife Service, Bureau of Land Management, U.S. Forest Service, and River Design Group. AWID includes private landowners and agriculture producers whose livelihoods depend on Deep Creek water for irrigation.

Background

Lower Deep Creek was historically characterized by a distributary channel network and expansive wetlands.Settlers to the Warner Basin in the late 1800s and early 1900s modified the stream system to promote agriculture production throughout the valley. The stream network was transformed into an irrigation system where the primary Deep Creek channel was excavated through the historical lake bed wetland south of Pelican and Crump lakes. Dredged lake bed sediment was placed along the channel to create elevated berms that further confined the stream flow to the corridor. To further support flood irrigation efforts across the valley, irrigation diversion structures were installed to divert water into canals and ditches - allowing for control and distribution.

Today the altered stream network and established irrigation system are still intact and agriculture continues to support the local economy. Cattle ranching and hay production make up the agriculture enterprise in the Warner Basin. Flood irrigation begins in April and extends through June when Deep Creek flows are at a sufficient amount. As flows decrease, water remains through the system for livestock to drink.

Work Done

In June of 2020 The Starveout Diversion Fish Passage Project was underway with final designs, permitting, bidding, and contractor selection. A local contract crew out of Lakeview was hired and construction began in October of 2020. The construction accomplished the replacement of both the west and east branch diversion weirs with rock ramp fishways. The ramps will pool water upstream which will allow for diverting water into the Starveout ditch for irrigation. The ramp was also designed to allow for passage of Warner sucker and redband trout through the diversion. The rock ramp was constructed of streambed matrix rock, with boulder ribs spanning the width of the ramp and large habitat boulders within the ramp to increase channel complexity. A 200 ft sluiceway was implemented along the edge of the east channel to allow sediment to be flushed, preventing the buildup of material at the irrigation withdrawal and diversion site. The project was completed in December 2020 to conclude two of six fish passage barriers on lower Deep Creek.

Public Awareness or Education

The following platforms are used by the LCUWC to continue outreach, education, and engagement efforts. The Starveout Diversion Fish Passage Project was covered in the local newspaper, LCUWC website, annual report, Facebook and Instagram page. The project was also presented to the Desert Fish Habitat Partnership and ODFW commission.
https://lakecountywsc.com

• Local Newspaper: A newspaper article is submitted quarterly to highlight council activities, project status, updates, and progress.
• Website: The council maintains a website where the Warner Basin projects are published through video, booklet,
and the Strategic Action Plan. All three online resources discuss the WBAHP goals and objectives and highlight on
the power or partnerships.
• Annual Report: Also found on the website is the LCUWC annual report. The report includes information on the
WBAHP annual accomplishments. Annual report was sent to all LCUWC partners and stakeholders.

• Social Media: LCUWC posts weekly on their Facebook and Instagram page sharing all things watershed related as
a platform for education and outreach. The weekly posting is called “Watershed Wednesday.” Project status,
photos, updates, and progress are also posted throughout the year.
• Tours: The LCUWC gives tours of the completed projects in the Warner Basin and also future projects to be
implemented. Tours are given to funding partners, local planners, and to the board.
• Presentations: The LCUWC presents annually to the County Commissioners on the Warner Basin projects along
with other organizations who are interested in the work. The council also holds an annual gathering with partners
providing status and progress through the year.

Lessons Learned

The Starveout Diversion Fish Passage Project was made possible by willing water users in the Warner Basin, expertise and technical assistance from core partners, seven funding organizations, a forward moving engineer company, and the commitment of the local equipment contracting crew. This formula of people and organizations made this project successful.

Recommendations

It is important to meet with project partners and stakeholders regularly as a large group and small group. Good communication amongst all folks is critical for project success.

Aquatic Habitat

Using Pg. 43 of the document, Fish Passage Structures, regulatory requirements were met with the following permits and authorizations.

-DSL – Permit to construct fish passage structure; General Authorization for Fish Enhancement or Removal/Fill permit.
-ODFW - 1) a determination that fish are present and that fish passage must be maintained; 2) an approval of a proposed fishway design, if one is required; and 3) a determination that the fishway, once constructed, is adequate and operated in an appropriate manner.

Guidance and/or Considerations were sought from the local ODFW Fish Biologist (Lakeview Office).

When fish passage facilities are planned or constructed around an in-channel barrier (temporary or permanent), the local ODFW District Fish Biologist should be contacted to:ì Determine what species of fish are present.ì Review passage structure designs, giving consideration to all native species.ì Obtain sources of technical assistance.
Technical assistance for the design of fish passage structures can also be obtained from the ODFW Fish Passage Coordinator (Portland Headquarters office).

Special Conditions

1) A flow meter or other water use measuring device shall be installed as part of the Project.

2) The project completion report shall include a copy of the operations agreement for the sediment sluiceway. The agreement should clearly outline the operation and maintenance requirements, as well as clearly outline roles and responsibilities for each signing party.

Funding Sources

Source	Identifier	Cash	Inkind Type	Inkind
Bureau of Land Management	BLM	$41,105.00		$0.00
Desert Fish Habitat Partnership	DFHP	$40,000.00		$0.00
WNTI/Open Rivers Legacy Fund	ORI	$85,307.00		$0.00
Oregon Department of Fish and Wildlife- ODOT	ODFW/ODOT	$50,000.00		$0.00
OWEB	220-8215-18643	$429,165.00		$0.00
US Fish and Wildlife Service	USFWS	$25,000.00		$0.00
WNTI/NFHP	WNTI	$50,000.00		$0.00

Totals

OWEB Amount	Non OWEB Cash	Inkind Total	Non OWEB Amount	OWEB Match	Total Project Cost
$429,165.00	$291,412.00	$0.00	$291,412.00	68.0%	$720,577.00

* This grant agreement has a special condition that alters the match funding requirement; to read the requirement see Exhibit B of the grant agreement.

Uploaded Files

Image Type	File Name	Description
Exhibit B	18643_Conditions.pdf	
Photo Point	1 Pre Project East Channel Across Diversion.png	East channel looking directly across the diversion towards the west.

Photo Point	2 Pre Project East Channel Below Diversion.png	East channel looking upstream below the diversion facing south/southwest
Photo Point	3 Pre Project East Channel Above Diversion.png	East channel looking downstream above the diversion facing north/northwest
Photo Point	4 Pre Project West Channel Across Diversion.png	West channel looking across the diversion facing north
Photo Point	5 Pre-Project West Channel Below Diversion.png	West channel looking upstream below the diversion facing east
Photo Point	1 Post Project East Channel Across Diversion .JPEG	East Channel looking directly across the diversion towards the west
Photo Point	2 Post Project East Channel Below Diversion .jpg	East channel looking upstream below the diversion facing south/southwest
Photo Point	3 Post Project East Channel Above Diversion .JPEG	East channel looking downstream above the diversion facing north/northwest
Photo Point	4 Post Project West Channel Across Diversion .jpeg	West channel looking across the diversion facing north
Photo Point	5 Post -Project West Channel Below Diversion.png.jpeg	West channel looking upstream below the diversion facing east
Photo (other)	Starveout Pre-Project Photos.pdf	Pre-Project Photos
Photo (other)	Additional Photos.pdf	Construction and Fish Salvage

Deep Creek - Starveout Diversion

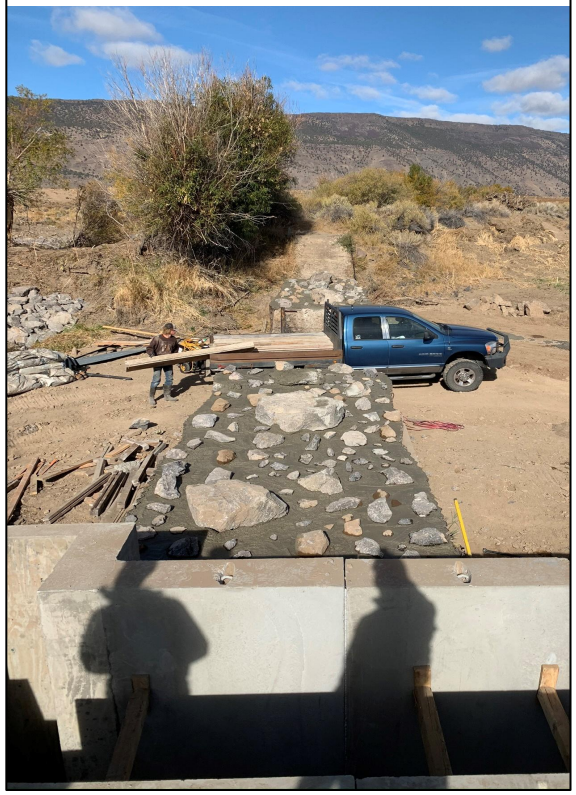
	Count	Fork Length (mm)
Warner Sucker	32	118-158
Redband Trout	7	168-920
Tui Chub	122	
Black Crappie	15	
Largemouth Bass	1	
Brown Bullhead	11	
Mussels (mostly floaters)	713	

Fish Salvage

Construction

Construction

Construction



Willow Staking


West Channel Complete

East Channel Nearing Completion

220-8215-18643 Before and After Photos

Photo Point: Before #1
File Name: 1 Pre Project East Channel Across Diversion.png
Photo Description: East channel looking directly across the diversion towards the west.
Photo Date: 05/18/2020

Photo Point: After #1
File Name: 1 Post Project East Channel Across Diversion .JPEG

220-8215-18643 Before and After Photos

Photo Point: Before #2
File Name: 2 Pre Project East Channel Below Diversion.png
Photo Description: East channel looking upstream below the diversion facing south/southwest
Photo Date: 05/18/2020

Photo Point: After #2
File Name: 2 Post Project East Channel Below Diversion .jpg
Photo Description: East channel looking upstream below the diversion facing south/southwest
Photo Date: 12/15/2020

220-8215-18643 Before and After Photos

Photo Point: Before #3
File Name: 3 Pre Project East Channel Above Diversion.png
Photo Description: East channel looking downstream above the diversion facing north/northwest
Photo Date: 05/18/2020

Photo Point: After #3
File Name: 3 Post Project East Channel Above Diversion .JPEG
Photo Description: East channel looking downstream above the diversion facing north/northwest
Photo Date: 12/15/2020

220-8215-18643 Before and After Photos

Photo Point: Before #4
File Name: 4 Pre Project West Channel Across Diversion.png
Photo Description: West channel looking across the diversion facing north
Photo Date: 05/18/2020

Photo Point: After #4
File Name: 4 Post Project West Channel Across Diversion .jpeg
Photo Description: West channel looking across the diversion facing north
Photo Date: 12/15/2020

220-8215-18643 Before and After Photos

Photo Point: Before #5
File Name: 5 Pre-Project West Channel Below Diversion.png
Photo Description: West channel looking upstream below the diversion facing east
Photo Date: 05/18/2020

Photo Point: After #5
File Name: 5 Post -Project West Channel Below Diversion.png.jpeg
Photo Description: West channel looking upstream below the diversion facing east
Photo Date: 11/18/2020