

Final Completion Summary

This restoration project, located on Bear Creek in SW Wheeler County, installed 21 beaver dam analogs (BDA) along a .37 mile reach of Bear Creek that is subject to low and often intermittent surface flow during late summer/early fall, a period critical to the survival of juvenile steelhead. Bear Creek is the largest spawning tributary to Bridge Creek. Wheeler SWCD staff is partnering with NOAA beaver analog experts on the design and monitoring. Project components included the installation of 21 beaver dam analog structures; providing a hands-on workshop for local restoration and contractor implementers; monitoring water quality, quantity and fish presence; and a summary of monitoring information.

Background

Being the largest tributary of Bridge Creek, Bear Creek represents an important spawning tributary for the summer run steelhead that utilize the watershed (Oregon Department of Fish and Wildlife, personal communication). However, much of the main channel on Bear Creek is subject to low and often intermittent surface flow during summer, a period critical to the survival of rearing juvenile steelhead following emergence from gravel during spring. Low and non-existent surface flow also contribute to high summer stream temperatures, lack of habitat quantity and complexity, and reduced riparian vegetation abundance and extent. These conditions render the Bear Creek watershed a population sink for threatened steelhead, in which a high rate of spawning adults produce few surviving juveniles capable of completing their life cycle.

Work Done

Construction of 21 beaver dam analog (BDA) structures throughout 532 m of intermittent stream channel produced an immediate increase in surface water storage, surface discharge, and caused floodplain inundation that will result riparian vegetation expansion. Implementation of fish population and habitat monitoring according to an experimental design to maximize the ability to document the effectiveness of restoration actions in achieving desired hydrologic and biological responses. Involvement of over 35 representatives from entities throughout central Oregon with the restoration implementation. Involvement took the form of a restoration workshop designed to give hands-on experience in the design and implementation of BDA projects.

Changes from Proposed

With the permitting process constantly evolving, and the expansion to a multiple phased project a comprehensive restoration manual could not be produced within the grant period.

Exact locations of the 21 structures are also slightly different than the layout that was provided in the proposal. BDAs require adaptive management throughout the process. Actual installation locations are chosen based on goal outcomes. Structures were placed to re-engage side channels, as secondary structures to provide additional support to primary structures, to function as grade control, and jump-start the aggradation process.

Public Awareness or Education

The Wheeler SWCD, in partnership with Anabran Solutions & Eco Logical Research, hosted a BDA workshop involving local contractors, and restoration practitioners throughout the John Day Basin. The workshop began with 1 day "classroom" session where various professionals involved with the project gave background information of historical beaver presence on the landscape, as well as providing background on previous successful projects. Two "field day" sessions also took place, the first involving local contractors with hands-on demonstration of construction of the structures, and the second day involving conservationists throughout the John Day Basin.

Lessons Learned

Although it only took place with 1 of the 21 structures installed on this project, after implementation, the need for adaptive management was evident. The structure that was lost likely during winter/spring high flows was a post-less structure, acting as a secondary support structure (structure 16) to direct flows towards the primary BDA structure. The Wheeler SWCD has also witnessed the "failure" of BDA structures on similar projects. In many cases, even when a structure fails, ecological benefits can still be observed. A common occurrence associated with BDA structure failure happens when the stream finds a path along one end of a structure and starts to scour the banks. This can scour out the posts on the ends of a structure causing it to "open up" similar to the way a gate swings. This very thing happened on BDA structures placed in Bridge Creek. The overall result of these "failures" produced more channel sinuosity. Materials were scoured from one structure, and deposited near the next, creating a more complex stream and habitat diversity. (See the uploaded aerial photo)

Recommendations

With such a rapid response in floodplain inundation, it would have been beneficial to have more aerial imagery, and even a combination of LiDAR & NVDI to better track the response of riparian vegetation to the install of the BDAs.

Aquatic Habitat

Wheeler SWCD has read and reviewed the Oregon Aquatic Habitat Restoration and Enhancement Guide, and all project components are within compliance with said document.

Special Conditions

Please see uploads

Funding Sources

Source	Identifier	Cash	InKind Type	Inkind
National Oceanic and Atmospheric Administration (NOAA)	In-kind	\$0.00	Materials	\$11,165.00
OWEB	217-6044-14238	\$26,959.00		\$0.00

Totals

OWEB Amount	Non OWEB Cash	Inkind Total	Non OWEB Amount	OWEB Match	Total Project Cost
\$26,959.00	\$0.00	\$11,165.00	\$11,165.00	41.0%	\$38,124.00

Uploaded Files

Image Type	File Name	Description
Photo Point	120_Riffle.jpg	A riffle
Photo Point	120 Rifle.JPG	A riffle
Photo Point	122_Riffle.jpg	A riffle
Photo Point	122 Riffle.JPG	A riffle
Photo Point	125_Glide.jpg	A glide
Photo Point	125 Glide.JPG	A glide
Photo Point	126_Riffle.jpg	A riffle
Photo Point	126 Riffle.JPG	A riffle
Photo Point	127_Lateral Scour Pool.jpg	the bottom of a lateral scour pool
Photo Point	127 Scour Pool.JPG	BDAs at the bottom of a lateral scour pool
Photo Point	128_Lateral Scour Pool.jpg	A lateral scour pool

Photo Point	128 Lateral Scour Pool..JPG	BDAs installed at a lateral scour pool
Photo Point	129_Glide.jpg	A glide
Photo Point	129 Glide.JPG	A glide with BDAs installed.
Photo Point	130_Riffle.jpg	A riffle
Photo Point	131_Straight Scour Pool.jpg	A straight scour pool
Photo Point	131 Straight Scour Pool.JPG	A straight scour pool
Photo Point	138_Glide.jpg	A glide prior to BDA install
Photo Point	138 Glide.JPG	A glide with BDAs installed.
Photo Point	140_Glide.jpg	A glide prior to BDA install
Photo Point	140 Glide.JPG	A glide with BDAs installed.
Photo Point	143_Glide.jpg	A glide prior to BDA install
Photo Point	143 Glide.JPG	A glide with BDAs installed.
Photo Point	146_Glide.jpg	At the bottom of a long glide
Photo Point	146 Glide.JPG	At the bottom of a long glide after BDA installation
Photo Point	147_Glide.jpg	Taken near the top of a long glide
Photo Point	147 Glide.JPG	Taken near the top of a long glide after BDA installation
Photo Point	154_Glide.jpg	A glide prior to BDA install
Photo Point	155_Straight Scour Pool.jpg	A straight scour pool
Photo Point	155 Straight Scour Pool.JPG	A straight scour pool after BDA installation
Photo Point	154 Glide.JPG	BDAs installed at the bottom of a glide

Photo Point	153_Riffle.jpg	A riffle
Photo Point	153 Riffle.JPG	A riffle with BDAs installed
Photo Point	152_Riffle.jpg	A riffle
Photo Point	152 Riffle.JPG	A riffle with BDAs installed
Photo Point	BDA_1 Back.jpg	Immediately after installation of first structure
Photo Point	BDA 1 back.JPG	Showing back watered pool created by BDA structure
Photo Point	BDA_2_SC.jpg	Taken below a structure designed to re-engage side channel
Photo Point	148_Riffle.jpg	A riffle
Photo Point	BDA 2 SC.JPG	BDA structure showing the successful re-engaged side channel
Photo Point	148 Riffle.JPG	A riffle with BDAs installed
Photo Point	150_Riffle.jpg	A riffle
Photo Point	150 Riffle.JPG	A riffle with BDAs installed
Photo Point	151_Glide.jpg	A glide prior to BDA install
Photo Point	Bear Before (1) 1.jpg	Setting up prior to BDA installation
Photo Point	Bear_Z_After (1) 3.jpg	Days after BDA installation
Photo Point	151 Glide.JPG	BDA installed at the start of a glide
Photo Point	Drone_Before.jpg	Aerial photo of the beginning of the treatment reach prior to BDA installation
Photo Point	Drone_z_After.jpg	Aerial photo of the beginning of the treatment reach after BDA installation
Photo Point	130 Riffle.JPG	BDAs installed near the top of a riffle
Supplemental Final Report	~!Middle Bear CR 217-6044 Comp.pdf	Final Project Completion Report

Photo (other)	!~Middle Bear Pre-project photos reduced.pdf	Pre-project Photos and Map
Photo (other)	!~Middle Bear CR 217-6044 Comp Photos Reduced.pdf	Project Completion Photos & Map
Project Designs	Complex & Structure Design Specs.pdf	Specifications of structures and design outcome goals.
Exhibit B	217-6044 EXHIBIT B FINAL.pdf	