



1992-026-01

Catherine Creek Red Mill Reach Restoration

Completion Report

Contract 80100

Report Covers: The Installation of a pressurized irrigation system on the Hefner/Langford ranch and covers all activity from September 1, 2019 to August 31, 2020.

Aaron Bliesner

Union County Soil & Water Conservation District

La Grande, OR

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### A. Introduction/Background Information:

This proposal is the first of a three-stage approach for improving habitat and flow conditions for ESA-listed aquatic species in Catherine Creek. The first stage improved instream flow quantity by converting flood irrigation to a high efficiency, pressurized system servicing 65.1 acres of property. Flood irrigation has proven to be inefficient water use, resulting in water quality degradation due to sediment and chemical laden water returning to the main channel. NRCS staff suggest that irrigation upgrades will result in more efficient water distribution, and will reduce water consumption by 40-60%. The landowner has signed a Cooperative Conservation Agreement with the District that will allow the completion of the second two stages of a floodplain restoration effort.

Stage two will improve physical riverine processes and aquatic habitat, coordinated across multiple ownerships. The majority landowner has agreed to allow the District access to 9 acres of historic floodplain property. The District will assist the Bureau of Reclamation (Reclamation) to design more natural channel geomorphology and sinuous alignment, increase floodplain connectivity, and improve aquatic habitat complexity. Stage two construction is planned for two phases, with an anticipated start in 2024.

Stage three of the project will establish a conservation easement to protect the newly established floodplain and riparian plants from livestock and agricultural impacts. The majority landowner has agreed to defer the transfer of water rights for the 9-acre project area for the first three years following construction, to irrigate new plantings. The District will assist the majority landowner in pursuing a CREP agreement.

Early records describe the Grande Ronde River and Catherine Creek as streams that meandered for about 70 miles before they left the Grande Ronde Valley. “Due to the flatness of the valley, the rivers meandered, snake-like, and were slow and sluggish in summer” (Gildemeister 1998). The rivers were connected to their floodplains and overflowed their banks during the spring freshet to form lakes, marshes, and wetlands. Beavers were plentiful, and influenced the vegetation seral stages and the mosaic of wetlands, meadows, flowers, cottonwoods, and willows that covered the bottomlands (Gildemeister 1998).

As explorers and settlers arrived in the Grande Ronde Valley, beavers were systematically harvested. By the 1860s, pioneer settlements established within the valley and the logging industry expanded, starting near the valley bottom and expanding up watersheds. The first

sawmill dam on Catherine Creek was constructed in 1863, about six miles above Union (Gildemeister 1998).

Agricultural development in the late 1800s focused on draining lakes and wetlands, and removing of riparian vegetation to increase the size of available pasture and farm lands. In 1869, a ditch was constructed to drain Tule Lake and the surrounding wetlands, and Catherine Creek was rerouted through a 3-mile long ditch. The practice of ditching, draining, ground leveling, and removing riparian vegetation has continued into the present. Thousands of cattle and sheep grazed the Catherine Creek meadows, and continues on the artificially created pasturelands today (Gildemeister 1998).

The flow regime for Catherine Creek has been greatly altered for irrigation of farmlands through the project site. Above the town of Union agricultural water diversions are limited with few acres available for farming. Flow data collected (USGS) above the town of Union through the summer months average around 23cfs. Flow data at the tenth street bridge in Union drops to about 11cfs on average through the summer months.

Catherine Creek through the project area is listed on the Oregon DEQ 303(d) list for water quality impairments in four categories. The stream segment is listed for excessive warm stream temperatures during the summer months, excessive sedimentation, issues with pH, and flow modifications in the summer related to the lack of instream flow. Flow modifications, and specifically the reduction in instream flow, has led to an overall decline in water quality through the project reach. Irrigation withdrawals have decreased the summer base flow through the project area by more than half the expected flow during the summer months, leading to elevated water temperature and diminished habitat space. The water that does return to the stream from flood irrigation is often high in nutrients, sediments, bacteria, and pesticides.

## **B. Discussion of Completed Work:**

The goal of Stage 1 of this restoration effort was to convert 65.1 acres of pasture land from flood to sprinkler irrigation. This provided a more efficient conveyance of water to the property, reduced the amount of water diverted from Catherine Creek, and minimized polluted return flows.

### **Objectives:**

- 1) Reduce water withdrawal and usage by 40 to 60% through the construction of a more efficient irrigation delivery system (measured at the site).
- 2) Improve water quality by the elimination of tailwater returns to Catherine Creek from flood irrigation by the reduction of sediment, bacteria, nutrient loading, and water temperature from direct solar radiation.
- 3) Gain landowner support and cooperation for restoration and conservation actions in Catherine Creek and the associated floodplain by 2021 through a signed Cooperative Conservation Agreement between the landowner and the District.

The project implementation consisted of several steps to convert the property from a flood irrigation system to a pressurized pipe system. The project took place within a ditch that has a

fish screen and no salmonids, lamprey, or other fish species were encountered during all phases of construction. All ground disturbing activities conducted for this project were in areas outside of the ordinary high water (OHW) of Catherine Creek. A project observation report and photo point monitoring are provided in two separate documents.

The landowner began the project by cleaning the ditch network servicing the water supply pond. The landowner then excavated and increased the size of the supply pond and recovered existing risers from a system that was historically installed but never used in order to be retrofitted and added to the new system. New wheel lines and pipe were delivered to the project site by the irrigation contractor. A main line trench was excavated and the pipe was bedded with finer material to decrease the chances of damaging the pipe and the trench was backfilled. The landowner reseeded the disturbed areas. A new pump, headworks, and flowmeter were then installed. The landowner paid to have all of the on-site electrical hookups completed. Oregon Trail Electric Cooperative (OTEC) then installed one transformer to the electrical system and installed powerline to the pump site. Once power was established to the site, the pump was fully installed and the wheel lines were connected to the system. The system was then tested and is working as designed. No issues with irrigation have been reported to date and water use will be monitored using the newly installed flowmeter.

The project was partially funded by BPA and was permitted through the HIP 3 programmatic biological opinion. This programmatic requires very similar requirements and is consistent with the Oregon Aquatic Habitat Restoration and Enhancement Guide. The Oregon Plan for Salmon and Watersheds, Oregon's Native Fish Conservation Policy, and the Oregon Conservation Strategy outline strategies for maintaining and enhancing native populations of fish and wildlife populations. The project was conducted in a high priority reach of Catherine Creek (lower valley reach) to promote and enhance conditions for naturally produced Chinook, steelhead, and bull trout populations. The project includes voluntary landowner efforts to restore ecological conditions, as well as efforts by project partners from state and federal agencies, the District, the Grande Ronde Model Watershed and the local tribes.

<i>Funding Sources</i>				
Source	Identifier	Cash	Inkind Type	Inkind
BPA	80100	\$50,742.00		\$0.00
Rob and Kyle Langford		\$5,752.50	Labor	\$12,000.00
OWEB	218-8205-16258	\$33,533.00		\$0.00
UnionSWCD		\$0.00	Labor	\$5,665.00

<i>Totals</i>					
OWEB Amount	Non OWEB Cash	Inkind Total Labor	Non OWEB Amount	OWEB Match	Total Project Cost
\$33,533.00	\$56,494.50	\$17,665.00	\$72,159.50	215.0%	\$105,692.50

### C. Lessons Learned & Adaptive Management

Cultural resource investigations and reporting continue to be a challenge to predict accurate time lines for and require additional planning. The rest of the project installation was seamless and successful.