Walla Walla County Conservation District

Hofer-Eastside-Westside Complex

Project Implementation Report

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Hofer-Eastside-Westside Complex

Fish Passage, Fish Screening
Pump Station & Pipeline Construction

Grant No. 04-1606N- SRFB
Grant No. 05-1539R SRFB
Grant No. S07-55310-001 EFSEC
Grant No. G0500182 DOE Piping
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Walla Walla County
Conservation District
2004 – 2009

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Complex Overview

The goal of these phased projects was to correct fish passage and stream flow issues at and downstream of Hofer Dam which is located on the Touchet River, 4.1 miles upstream from its confluence with the Walla Walla River. Built sometime around the turn of the last century, it is a concrete gravity dam that spans the river and provides irrigation water to the Eastside and Westside Irrigation Districts, which are both served by open delivery ditches. Specific issues to be addressed were:

1. The channel wide fish passage barrier at Hofer Dam.

2. A second fish passage barrier was located at the Eastside Irrigation District inverted siphon under the Touchet River ¼ mile downstream from Hofer Dam.

3. ESA non-compliant fish screens for the Eastside/Westside diversion structure at Hofer Dam.

4. Inefficient and difficult to manage open delivery ditches serving the two irrigation districts.

5. Seasonally inadequate stream flows for salmonid migration below Hofer Dam due to irrigation withdrawal.

A multi-phased approach was taken by the Walla Walla County Conservation District (WWCCD) that included:

- Design and construction of a new fish ladder and remediation of the passage problem at the Eastside siphon.

- Design and construction of a high-tech automated irrigation water delivery system complete with self-cleaning rotating screens that met all of NOAA's fish screen requirements.

- Design and construction of a pumping plant at the Eastside/Westside water division point.

- Design and construction of a pressurized pipeline delivery system servicing the Westside Irrigation District requiring approximately 37,000 feet of pipeline to serve almost 1,200 acres that would put in trust over 1,825 ac-ft of water per year.

- Design and construction of a pressurized pipeline delivery system servicing the Eastside Irrigation District requiring approximately 35,500 feet of pipeline to serve almost 800 acres that would put in trust over 1,309 ac-ft of water per year.

Project Results – Fish Passage Remediation – The Fish Ladder and Diversion Fish Screens

SCOPE OF PROJECT

The scope of this phase of the project was to correct fish passage issues at Hofer Dam on the Touchet River. More specifically, there were two issues to be addressed:

- Fish passage at Hofer Dam which was considered a full channel barrier blocking at least 25% of returning adults to upstream migration.

- The fish passage barrier developed due to high water damage and remediation attempts to the Touchet Eastside Irrigation District inverted siphon that ran under the Touchet River ¼ mile downstream of Hofer Dam.

Hofer Dam before remediation

Hofer dam antiquated fish ladder

Hofer dam antiquated irrigation diversion

Non-compliant fish screen at Hofer dam

TARGET SPECIES

The target species for the Touchet River are Mid-Columbia Basin Steelhead (primary) and Bull Trout which are listed as Threatened under the Endangered Species Act as well as Spring Chinook salmon. Steelhead are the primary target species with adult summer steelhead migrating upstream from September through March and juvenile steelhead out migration occurring between March and July. There are small numbers of Spring Chinook found in the Touchet River; most of the spawning adults are thought to be recruits from hatchery production from other river systems. In 2000, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) started planting pre-spawning adult Spring Chinook in the Walla Walla Basin. There have been discussions about planting pre-spawning adult Spring Chinook in the Touchet River. Spring Chinook adult migration occurs between mid-April and end of June. Bull Trout are not generally found in the lower Touchet River Basin; however, there are populations in both the upper Walla Walla and Touchet River systems. Removal of the passage barriers associated with this project will help provide future biological interconnectivity between these isolated populations.

THE ROAD TO IMPLEMENTATION

The ultimate objective of this project (Phase 1 and Phase 2) was to improve fish passage conditions at Hofer Dam on the lower reach of the Touchet River, which is the largest tributary of the Walla Walla River. The Touchet River drainage above Hofer Dam has an abundance of spawning and rearing habitat and is one of the primary steelhead production areas in the Walla Walla River basin. Improvement of passage conditions at Hofer Dam will improve or enable adult access to 186 miles of stream in the Touchet River drainage and reduce the mortality of out-migrant smolts produced in that same area.

The passage conditions at Hofer Dam have long been identified in the various Walla Walla Basin planning and recovery documents as one of the key factors responsible for the decline of native summer run steelhead in the basin. It has been considered by most basin stakeholders as perhaps the biggest and most complex passage barrier for adult upstream migration in the watershed.

In 2005, the Walla Walla County Conservation District received a Salmon Recovery Funding Board grant (SRFB) to complete Phase 1 of the Hofer Dam Fish Passage project. Phase 1 covered everything leading up to construction including: 1) a feasibility study resulting in an alternative agreed to by all stakeholders, 2) an engineered design and construction cost estimate, and 3) all the necessary permits and a landowner agreements. Phase 2 of the project was the construction according to the plans and permit conditions completed in Phase 1. Preliminary estimates for construction of the project ranged between $1.0 and $1.5 million.

Hofer Dam fish ladder under construction

Hofer dam with new fish ladder

Phase 1 was completed in late 2005 and was followed by construction of both the fish ladder and automated self-cleaning fish screens at the diversion that were completed in the fall of 2006. Construction funding came from two sources: The Energy Facility Site Evaluation Council (EFSEC) provided $400,000 and the Washington Salmon Recovery Funding Board (WA-SRFB) provided $551,605. Other partners were WDFW who assisted with the compliance work (permitting, etc.) and Tri-State Steelheaders (TSS) who provided $24,000 in cost-share match. The project was also strongly supported by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Touchet Westside and Eastside Irrigation Districts.

The final cost of the completed project was $875,605, far below project estimates.

The Hofer Dam Fish Passage Project was truly a "win-win" for all stakeholders -- both irrigators and fisheries managers. With irrigators agreeing to take a big reduction in water use when the fish need it most, i.e. mid-September through November, this fisheries resource was a big winner. But the irrigators were big winners, too, with a new, high-tech diversion that makes it much easier to manage irrigation water when it is available.

Project Results – Westside/Eastside Irrigation Districts' Pumping Station

SCOPE OF PROJECT

- Next in sequence following construction of the fish ladder/diversion fish screen was the design and construction of the Eastside and Westside Irrigation District pipelines which had to be done without interrupting the supply of water for irrigation. An essential component of the pipeline system was a pumping station to pressurize the new piped conveyance systems for both the Westside and Eastside Irrigation Districts. Both pipelines were designed to supply roughly half the maximum diversion rate specified by the water right via gravity flow with variable speed pumps running only when pressure sensors indicate high water use. This feature reduces the cost of operation and allows managers to use the pumps to flush sediment out of the buried pipeline.

New Touchet Westside/Eastside Irrigaton District pumping station

THE ROAD TO IMPLEMENTATION

The Westside/Eastside pumping station was designed and constructed in 2007-08 in conjunction with the Westisde piping project. This phase was funded by the WA Department of Ecology at a cost of $323,000.

Project Results – Westside Irrigation District Piping Project

SCOPE OF PROJECT

The overall objective of replacing the open ditch conveyance system with a piped system was to correct several problems such as unacceptable water losses due to seepage and evaporation and the difficulty in maintaining the ditch and controlling weeds. This phase of the project involved:

- Installing a new gravity pipeline conveyance system to serve the Touchet Irrigation District to the Eastside/Westside pumping station – completed in 2008.
- Replacing the old inefficient open ditch conveyance system serving the Touchet Westside Irrigation District with a new pressured pipeline delivery system.

The Touchet Irrigation District conveyance system was built sometime during the early 1900's for the purpose of delivering irrigation water to farmers downstream of Hofer Dam on the west side of the Touchet river. It is important to note that the Irrigation District's very senior water

right allowed them to virtually divert all the water available at certain times of the year and essentially dewater the stream below the diversion structure.

Westside ditch pre-construction

Westside delivery system pre-construction

Old structure that splits flow for Westside (60%) and Eastside (40%)

THE ROAD TO IMPLEMENTATION

Increasing and/or restoring flows to area streams is critical to summer steelhead restoration in the Walla Walla Basin. As mentioned above, the Touchet Irrigation District could legally divert all available flows, a practice that would essentially dewater the lower Touchet River, especially in late summer or in short water years. As part of the negotiated agreement, the new pumping plant and pressurized conveyance system would allow very efficient delivery of water needed to meet irrigation requirements and greatly improve the ability for the District to manage their water delivery system. In return, the District agreed to greatly reduce irrigation water use during critical adult steelhead migration periods to maintain greater instream flows for upstream passage.

In 2007 the Walla Walla County Conservation District used Technical Assistance funding provided by the WA State Conservation Commission's (WSCC) Irrigation Efficiency Grant Program (IEGP) to design the Westside piping project. With approval of the design WWCCD utilized funding from the Irrigation Efficiency program and the Conveyance Infrastructure program to construct the project during the period between October, 2007 and May, 2008.

The magnitude of the undertaking was historical in scope and impact on the irrigated agriculture community. To date, this project is the largest irrigation efficiencies project yet implemented in the Walla Walla Basin. After completion in 2008, the new pressurized system delivered water as designed to approximately 17 on-farm users covering almost 1,200 acres of cropland. The project required over 37,000 feet of piping and returns 1,825 acre feet of water per year to in-stream flow for fish.

The WWCCD completed this phase of the Complex for $1,564,000 all of which was granted by Department of Ecology. Of this, $1,114,000 was funded through the Washington State Conservation Commission (WSCC) administered Irrigation Efficiency Grant Program and $450,000 was funded directly from Ecology through the Conveyance Infrastructure Grant Program

Project Results – Eastside Irrigation District Piping Project

SCOPE OF PROJECT

The scope of this phase was to complete the modernization of the Touchet Eastside Irrigation District's irrigation water delivery system through the following actions:

- Beginning at the newly replaced inverted siphon under the Touchet River, Replace the old inefficient open ditch conveyance system serving the Touchet Eastside Irrigation District with a new pressured pipeline delivery system.
- Install new irrigation pipeline laterals to deliver irrigation water to approximately 800 cropland acres and serve the more than 20 operators on the system.

The Eastside Irrigation District conveyance system was built sometime during the early 1900's for the obvious purpose of delivering irrigation water to farmers on the east side of the Touchet River downstream of Hofer Dam. As noted above, the combined Eastside and Westside water right is very senior and allowed them to divert all the flow in the Touchet River at certain times of the year and essentially dewater the stream below the diversion structure.

Eastside ditch pre-construction with piping staged

Eastside delivery system pre-construction with piping staged

THE ROAD TO IMPLEMENTATION

To reiterate, increasing and/or restoring flows to area streams is critical to summer steelhead restoration in the Walla Walla Basin. As mentioned above, the Touchet Irrigation District could legally divert all available flows, a practice that would essentially dewater the lower Touchet River, especially in late summer or in short water years. The negotiated agreement described above under the Westside Piping Phase applies to the Eastside Irrigation District as well.

Staged pipe eastside of North Touchet Road

Staging HDPE piping used to go through stand of trees and under county road

Fusion welding machine that literally melts the sections of pipe together

HDPE ready for installation

2-ft I.D. High-Density Polyethylene (HDPE) piping

Old Eastside Canal after being filled in

Old Eastside Canal after being filled with soil and new pipeline alignment in background

Installed PVC conveyance line

HDPE fusion-welded joint

Installation of PVC conveyance line along County road

In 2007 the Walla Walla County Conservation District received an Irrigation Efficiencies grant from WA-Department of Ecology (WA-DOE) to complete the construction of the project. After the designs were approved and agreements finalized, contractors began installation of the project.

The Eastside piping project followed on the heals of the construction of the Westside Irrigation District piping project. The combination of the two piping projects was overall the largest irrigation efficiencies projects yet completed in the Walla Walla Basin. The new pressurized system for the Eastside project delivers water to more than 20 on-farm users covering approximately 800 acres of cropland. The project required over 35,500 feet of piping and restores over 1,309 acre feet per year of water to in-stream flow for fish.

Like the Westside project, the WWCCD used Technical Assistance funding provided by the WSCC administered Irrigation Efficiency Grant Program to design the Eastside pipeline. The WWCCD completed the Eastside Irrigation District project at a cost of $1,208,000 all of which was granted by Department of Ecology. Of this, $888,000 was funded through the WSCC administered Irrigation Efficiency Grant Program and $320,000 was funded directly from Ecology through the Conveyance Infrastructure Grant Program.

SUMMARIZATION OF ACCOMPLISHMENTS & COSTS

In summary, the WWCCD began working with the Westside and Eastside Irrigation Districts in 2004 to address their ESA and water quality issues. The following is a summary of accomplishments resulting from the Hofer-Eastside-Westside Complex upgrade:

Hofer Dam Design – $128,605 funded by WA – Salmon Recovery Funding Board (SRFB); $24,000 matching funds provided by Tri-State Steelheaders. The following businesses and their employees contributed to the design of the Hofer dam project:

- Anchor Environmental was contracted to complete the design work which was completed in 2005.

Hofer Dam Construction – $300,000 funded by Energy Facility Site Evaluation Council (EFSEC); $423,000 funded by SRFB. The project consisted of a high-tech automated irrigation water diversion system complete with self-cleaning rotating screens that meet all of NOAA's fish screen requirements. It also included replacement of an inverted siphon pipe which had created a major barrier to adult fish passage on the Touchet River. The following businesses and their employees contributed to construction of the Hofer dam project which was completed in 2006:

- Apollo Construction was the primary construction contractor
- Anchor Environmental provided construction management;
- Doyle Electric installed electrical components;
- Dunning Irrigation Supply built the hoist & components;
- Hydrolox manufactured the fish screens;
- A-Core performed concrete quality control testing.

Pump Station Construction – 100% funded by WA Dept. of Ecology. The pump station design work was done by WWCCD/WSCC engineers and technical personnel as Technical Assistance under the Irrigation Efficiency Program. The cost of construction was $323,000 which was provided by a single Conveyance Infrastructure grant from WA Department of Ecology (DOE). The following businesses and their employees contributed to construction of the Eastside/Westside pump station project which was completed in 2006:

- Appellation LLC. provided construction management;
- Dunning Irrigation Supply was the primary contractor;
- Current Electric was the electrical subcontractor;
- Double T Construction was the subcontractor for concrete work.

Westside Pipeline Construction – This is a pressurized pipeline delivery system consisting of approximately 37,000 feet of pipeline which serves almost 1,200 acres of irrigated farmland. The project was 100% WA Dept. of Ecology funded. The Westside Pipeline design work was done by WWCCD/WSCC engineers and technical personnel as Technical Assistance under the Irrigation Efficiency Program. The total construction cost was $1,564,000 with $1,114,000 of that funded through WSCC administered Irrigation Efficiency Program and $450,000 provided through a WA Dept. of Ecology Conveyance Infrastructure grant. The following businesses and their employees contributed to construction of the Westside pipeline project which was completed in 2008:

- Appellation LLC. provided construction management
- Premier Excavation was the primary contractor

- Dunning Irrigation Supply was the on-farm pump station subcontractor
- Current Electric was the electrical subcontractor.

Eastside Pipeline Construction – This is a pressurized pipeline delivery system consisting of approximately 35,500 feet of pipeline which serves 800 acres of irrigated farmland. This phase was 100% WA Dept. of Ecology funded. As with the Westside project, the Eastside Pipeline design work was done by WWCCD/WSCC engineers and technical personnel as Technical Assistance under the Irrigation Efficiency Program. The total cost of the project was $1,208,000 with $888,000 funded through WSCC administered Irrigation Efficiency Program and $320,000 provided through WA Dept. of Ecology Conveyance Infrastructure grant. The following businesses and their employees contributed to construction of the Eastside pipeline project which was completed in 2009:

- Appellation LLC. provided construction management
- Premier Excavation was the primary contractor
- Dunning Irrigation Supply was the on-farm pump station subcontractor
- Current Electric was the electrical subcontractor.

IT'S OBVIOUS THAT IRRIGATORS BENEFITED FROM THE HOFER-EASTSIDE-WESTSIDE UPGRADE BUT WHAT ABOUT FISH?

YOU DECIDE