NORTH FORK CABIN CREEK CULVERT REPLACEMENTS

Completion Report

Performance Period
December 1, 2009 to December 31, 2011

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Background

The project replaced three culverts on the North Fork Cabin Creek with two channel-spanning bridges and one bottomless arch. North Fork Cabin Creek is habitat for ESA-listed Snake River summer steelhead (Upper Grande Ronde population), resident rainbow and other native fish. The Cabin Creek system is a mid-elevation tributary to the Grande Ronde River. The North Fork Cabin Creek, at the project sites, is an intermittent stream, usually ceasing to flow in late July or early August. Flow in the headwater tributaries is perennial and provides year-long steelhead rearing and resident fish habitat. All three of the culverts are partial to complete barriers (depending on flow) to adult steelhead passage. All are complete barriers to juvenile steelhead and resident fish. Two of the culverts are on a county road, one is a private drive.

Existing Conditions

North Site

The North Site is on Robinson Road, managed and maintained by Union County Public Works Department. The pre-project structure was a four-foot round concrete culvert. The culvert had an approximate 5% slope with a two foot drop at the outlet. The initial installation (date unknown) resulted in relocation of the stream channel to facilitate the positioning of the culvert to be perpendicular to road. This required a 90 degree corner on the upstream side which frequently resulted in the culvert plugging during peak flows. It was possible, during very favorable flow conditions at the peak of the migration, for an occasional adult steelhead to pass the structure (see pre-project picture).

Middle Site

The Middle Site is on a private drive approximately 1/3 mile below the North Site. The pre-project structure was a four-foot round corrugated metal culvert with about a four-foot drop at the outlet. Bedload had accumulated above the culvert and a three-foot deep scour pool had formed below the outlet. Juvenile passage was not possible and adult steelhead passage was unlikely due the drop at the outlet and high water velocities (see pre-project picture).

South Site

The South Site is on Robinson Road approximately ¾ mile below the Middle Site and is managed and maintained by Union County Public Works Department. The pre-project structure was a four-foot round concrete culvert similar to the North Site. It had about a 5% slope and a three-foot drop at the outlet. Juvenile passage was not possible and adult steelhead passage was unlikely, except under very favorable water conditions, due the drop at the outlet and high water velocities (see pre-project picture).

Project Location

The project area descriptions for the culverts are:

Site 1 Robinson Road (south site)
Legal description: T3N, R39E, Sec. 35, NE ¼ of the SW ¼

Site 2 Private drive (middle site)
Legal description: T3N, R39E, Sec. 26, SW ¼ of the SW ¼

Site 3 Robinson Road (north site)

Legal description: - T3N, R39E, Sec. 26, NW¼ of the SW ¼

Project Description

The GRMW coordinated with the Oregon Department of Fish and Wildlife to determine the use of the Cabin Creek system by steelhead. It was identified as a system used by steelhead. The culverts were determined to be near-full barriers to adult migration and complete barriers to juveniles. The GRMW contacted Union County Public Works Department to assess their interest in replacing the existing culverts and their ability to help with the construction. The GRMW contacted the owner of the private drive to determine his interest in allowing us to replace the culvert. All contacts resulted in positive responses to replace all three structures.

Project objectives were:

- Provide year-round fish passage for all life stages of all native species, particularly Snake River steelhead
- Maintain streambed and streambank stability
- Install structures that would pass 100-year peak flows

The GRMW accomplished the following planning, design and implementation activities:

- Contracted with Anderson Perry & Associates to do site surveys and prepare engineering designs.
- Completed ESA consultation with NOAA Fisheries through BPA's Habitat Improvement Programmatic (HIP II)
- Completed Cultural Resource Section 106 consultation with Oregon State Historic Preservation Office, the Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce Tribe.
- Coordinated and obtained fish passage design approval from NOAA Fisheries and the Oregon Department of Fish and Wildlife (ODFW).
- Contracted with Anderson Perry & Associates to conduct construction engineering inspections.

Completed Construction Activities

The decision was made to have the Union County PWD crews construct bridges, as per the preferred design, at the North and South sites. Bridges were full channel-spanning structures. Union County has constructed many of these Anderson Perry-designed bridges and typically about 2/3 of the cost of private contractor construction. A bottom-less metal arch on precast concrete footings was the preferred structure on the private drive. Union County PWD managed all aspects of construction on the North and South sites and constructed the bridges beginning work on July 19, 2010 and completing the work on September 17, 2010.

Union County PWD determined they did not have the equipment capability to construct the arch at the Middle Site. The precast concrete footings were heavier than could be placed by their excavator. GRMW decided to delay construction on the Middle Site to 2011, and at that time put the project out to bid. The construction contract was awarded to Iron Triangle LLC in late January 2012. Construction commenced on September 19, 2011 and was completed October 13, 2011.

The following construction activities were completed on the North and South Sites:

- Conducted fish salvage and release (from pool below North Site, South Site was dry)
- Removed and disposed of the concrete culverts

- Excavated for bridge footings
- Poured concrete footings and installed steel I-beam bridge supports (North Site - 28' span, South Site 22' span)
- Installed steel bridge decking
- Installed steel guard rails
- Installed streambed simulation rock above, through and below the structures
- Installed concrete precast ecoblock wingwalls reinforced with riprap
- Installed rock vortex channel-spanning weir for grade control below each structure
- Hauled and placed surface road rock
- Erosion control seeded all disturbed ground

The following construction activities were completed on the Middle Site:

- Conducted fish salvage from the pool below the culvert
- Removed and disposed of the steel culvert
- Excavated for and installed the precast arch footings
- Assembled and constructed the steel arch (17' span)
- Installed streambed simulation rock above, through and below the structure
- Installed riprap on the upstream side of the bridge
- Installed rock vortex channel-spanning weir for grade control below the structure
- Hauled and placed surface road rock
- Erosion control seeded all disturbed ground

Monitoring

GRMW and Union County PWD will annually monitor the North and South bridge sites for stability of the streambed simulation material, movement or damage to the riprap and stability of the rock weirs. Additionally, rock weirs will be monitored to assure that fish passage continues to meet criteria. The GRMW will monitor the same at the Middle Site.

Budget and Expenditures

Construction of all three of the structures was entirely funded by BPA.

North Fork Cabin Creek Budget

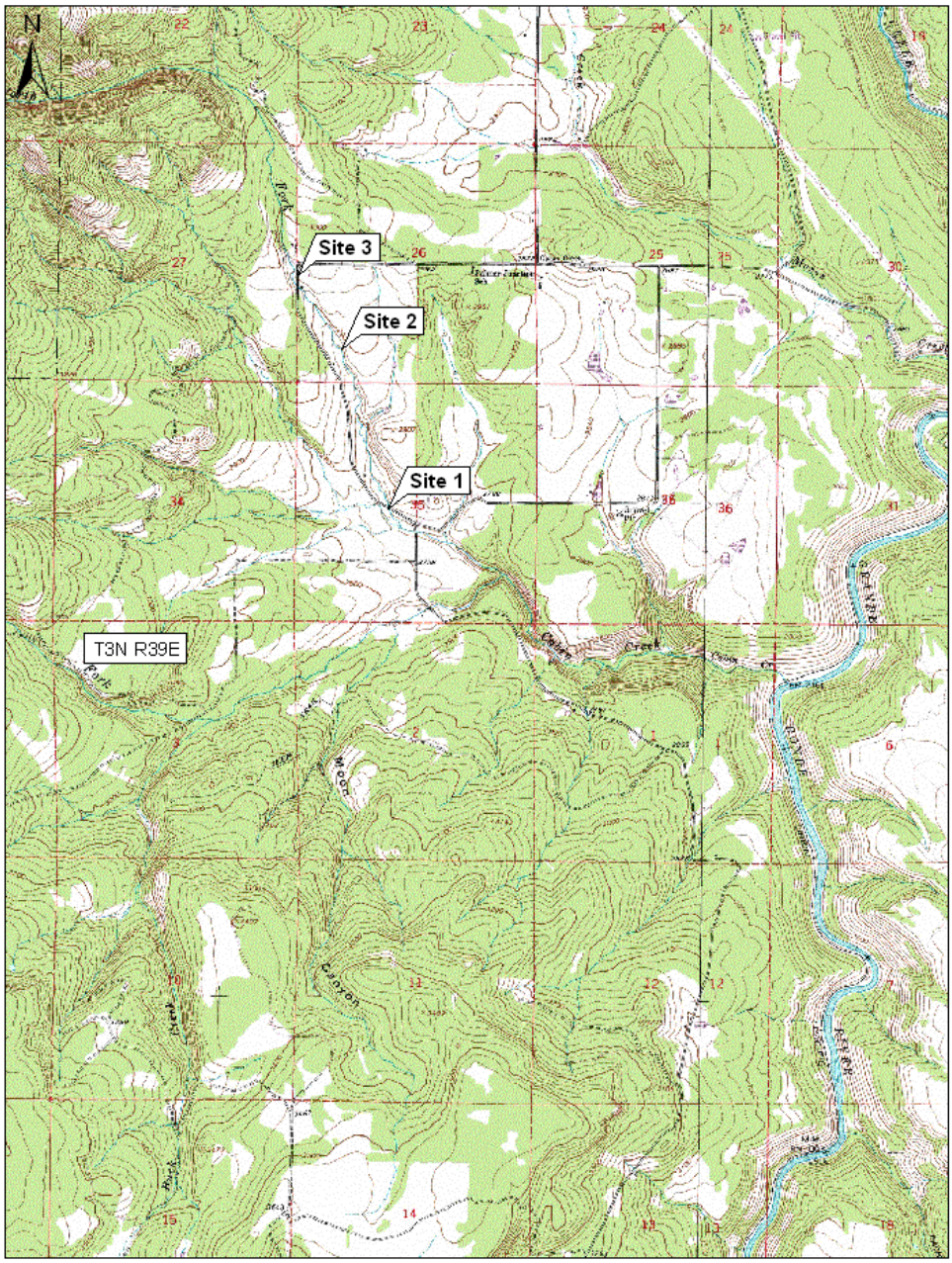
North Site:	**Expenditures**
Labor - Excavation for Bridge-rental of equip	$760
Material - Steel Bridge	$50,739
Labor - Steel Bridge-Union County	$54,362
Material - Streambed Simulation Rock	$2,298
Material - Base Rock	$2,669
Material - Guardrail	$49
Labor-remove/reconst.fencing-materials	$68
Labor - Engineering & Inspection	$993
North Site Subtotal	**$111,938**

Middle Site:	
Labor - Mobilization - Iron Triangle	$940
Labor - Clearing and Grubbing - Iron Tri	$5,496
Material-New Steel Bottomless arch culvert	$30,039
Install Bottomless Arch Culvert	$8,059
Streambed Simulation	$9,900
Labor-removal of existing culvert	$259
Base Rock- Iron Triangle	$1,059
Access Road	$5,074
Grade Control Structure	$4,062
seeding and mulching	$1,600
Labor - Engineering & Inspection	$10,000
Middle Site Subtotal	**$76,488**

South Site:	
Material - Erosion Control	$120
Material-Steel Bridge	$47,494
Labor- Steel Bridge-Union County	$44,502
Material - Streambed Simulation Rock	$5,261
Material - Base Rock	$57
Material - Guardrail	$49
Labor-Engineer & Inspection	$1,945
South Site Subtotal	**$99,428**

Project Total	**$287,854**

North Fork Cabin Creek



Vicinity Map

Photos

North Site #3

Pre-Project. Flow velocity and excessive drop combined to restrict steelhead and resident fish passage.

Post-Project. Stream was realigned to eliminate 90 degree corner above the old concrete culvert. Bridge wingwalls were reinforced with riprap and a vortex rock weir was installed below the bridge.

Middle Site #2

Pre-Project. Flow velocity and excessive drop combine to restrict steelhead and resident fish passage.

Post-Project. Bottomless steel arch was placed on concrete precast footings. Vortex rock weir was installed below the arch.

South Site #1

Pre-project. Downstream end of culvert. Flow velocity and excessive drop combined to restrict steelhead and resident fish passage.

View from above bridge looking downstream. Stream alignment was unchanged.