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WILDCAT and WALLUPA BRIDGE REPLACEMENTS

Completion Report

Performance Period
May 1, 2008 to April 30, 2010

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Introduction

Wildcat and Wallupa Creeks are significant steelhead producers in the Lower Grande Ronde. Sediment and temperature are limiting factors for steelhead production in this system. The geography is steep canyon country characterized by flashy peak flows. Wallupa Creek is a tributary of Wildcat Creek which is a direct tributary to the Lower Grande Ronde River. The projects replaced under-sized, failure prone culverts with a full channel-spanning bridges.

Location

The Wildcat bridge is approximately 3 miles above the confluence of Wildcat with the Grande Ronde River. The project legal description is T.4N., R. 43E., Sec. 7, SW¼ of NW 1/4. (Figure 1). The Wallupa bridge is approximately 5 miles above the confluence of Wallupa and Wildcat Creeks. The project legal description is T.4N., R. 42E., Sec. 35, SW¼ of SE 1/4. (Figure 2).

Prior Condition

The Wildcat crossing has failed multiple times over the years, each time introducing large quantities of road fill, surface gravel and soil into the system. The prior crossing, an undersized arch, last failed in 1997. The damaged arch was salvaged and put back in place. It was partially collapsed, reducing capacity. The arch was 9.8 feet wide at the bottom. Average bankfull width through this reach is twenty six feet. The risk of future failure was high due to its size and collapsed condition. The arch was a velocity barrier to migrating adult steelhead and juveniles during peak flows. There are approximately 12 miles of available spawning and rearing habitat above this crossing.

The Wallupa crossing also has failed multiple times. The prior crossing, an 8-foot round culvert last failed in 2002. The culvert was a velocity barrier to adult steelhead and blocked all juvenile steelhead and resident fish passage. There are 1.5 miles of spawning and rearing habitat above the crossing.

Project Description

This project constructed two channel-spanning bridges to replace two failure-prone culverts that were fish passage barriers. The Wildcat structure spanned 50 feet and the Wallupa structure spanned 38 feet. Project cooperators were the Grande Ronde Model Watershed, Wallowa County and the U.S. Forest Service.

The project was sponsored by the Grande Ronde Model Watershed Foundation (GRMWF). The GRMWF conducted all phases of project management including planning, coordination, ESA consultation, permitting, construction subcontracting and fiscal management. Construction funding was provided by BPA under the Fish and Wildlife Mitigation Program, and by the Oregon Watershed Enhancement Board. In-kind labor and materials were provided by Wallowa County.

The project design, including a hydrologic study, foundation investigation, preliminary designs, cost estimate and final design were provided by professional engineering staff of Anderson-Perry and Associates, La Grande, Oregon. The selected structures, most appropriate for this site, ie. meet a design life of 75 years and withstand a peak event of 100 years+, were full channel-spanning bridges. Due to the flashy nature of the watersheds and repeated failure of culverts and open-bottom arches in these types of systems, design criteria required a structure that was anchored to bedrock and completely spanned the stream channel, without restricting flow below bankfull width. This eliminated any type of culvert from serious consideration.

Open-bottom arch designs were eliminated due to the long span required and the foundation requirements, ie. anchored to bedrock.

The project objectives were:
- Eliminate sediment inputs to Wildcat Creek and the Grande Ronde River
- Provide season-long access for adult and juvenile steelhead, and resident fish
- Eliminate periodic road closures due to culvert failures

Project tasks were:
- Complete ESA consultation, cultural resource compliance and permitting
- Prepare construction contract, advertise, conduct pre-bid site visit, review bids, award contract
- Construct traffic bypass
- Remove and dispose of existing culverts
- De-water and isolate the in-channel work areas
- Conduct fish salvage as necessary.
- Construct bridges (excavation, form and pour foundation, drive pilings, install pre-stressed slabs, install railings, place gravel for approaches
- Install riprap around bridge foundations
- Implement erosion control and site rehab (shaping and seeding).

Methods, Results & Discussion

Construction

The construction contract for both bridges was awarded to D. L. Edmonson, Inc. The GRMWF subcontracted with Anderson-Perry & Associates to perform technical construction inspection. Lyle Kuchenbecker performed additional inspections and managed the project.

Construction Schedule

• Construction contract award	May 5, 2008
• Pre-construction meeting	June 5, 2008
• Wallowa County PWD installed detour bridge at Wildcat	Week of June 16
• Wallowa County PWD began detour construction at Wallupa	Week of June 30
• Contractor removed culvert, excavated for bridge at Wildcat	Week of June 30
• Contractor placed Wildcat rip-rap, completed Wallupa detour	Week of July 7
• Contractor excavated for bridge, installed pilings at Wallupa	Week of July 14
• Contractor constructed forms and placed steel at Wallupa	Week of July 21
• Contractor placed concrete at Wallupa	Week of July 28
• Contractor formed and placed steel rebar at Wildcat	Week of August 4
• Contractor placed concrete at Wildcat and rip-rat at Wallupa	Weeks of Aug 11 & 18
• Pre-cast concrete slabs placed on footings at both bridges	Week of Aug 25
• Wallowa County PWD removed the detour bridge at Wildcat	Week of Sept 1
• Contractor completed bridge rail & opened bridge at Wallupa	Week of Sept 1
• Completed bridge rails at Wildcat	Week of Sept 8
• Guardrails installed at both bridges	Week of Nov 4
• All work completed	November 5

Financial

Wildcat Bridge

Work Element	Source	Requested $$	Actual $$
Final design, specifications, bid package	GRMW(in-kind)	$10,000	$10,000
ESA consultation, permitting	GRMW(in-kind)	$11,000	$11,000
Project management	GRMW(in-kind)	$4,800	$4,800
Construction & engineering inspection	**BPA**	**$39,000**	**$31,739**
Construction (contracted services)	OWEB	$152,175	$136,630
Construction (supplies and services)	**BPA**	**$181,440**	**$125,943**
Detour, traffic control, riprap, rock, erosion	Wallowa Co(in-kind)	$23,000	$23,000
Fiscal administration	OWEB	$1,800	$1,635
Post-implementation status reporting	OWEB	$1,920	$1,920
	Total	$425,135	$346,667

Wallupa Bridge

Work Element	Source	Requested $$	Actual $$
Final design, specifications, bid package	GRMW(in-kind)	$10,000	$10,000
Construction & engineering inspection	**BPA**	**$39,000**	**$31,739**
Construction (contracted services)	OWEB	$131,600	$120,600
Construction (supplies and services)	**BPA**	**$155,000**	**$114,494**
Detour, traffic control, riprap, rock, erosion	Wallowa Co(in-kind)	$20,000	$20,000
Fiscal administration	OWEB	$2,632	$2,412
	Total	$358,232	$320,984

Results

Structure construction was completed as per the design specifications, with a few minor exceptions. Concrete barriers at Wildcat were used on the southeast corner of the bridge in place guardrails due to shallow solid rock which prevented driving posts for the guardrails. Riprap was not needed to protect the south foundation, also due to rock. An in-water work period extension from September 15 to October 15 was requested, but was not actually needed.

Discussion

Construction progressed well, and as expected. The construction contract was awarded to an experienced, well equipped contractor. A subcontract for construction inspection was awarded to the same engineering firm that designed the bridges which assured high quality construction to design specifications.

Permitting, ESA Consultation and Cultural Resource compliance work was completed in a timely manner and did not delay construction. The bridge spans, 50 feet at Wildcat and 38 feet at Wallupa, resulted in flow capacities of nearly four times the capacity of the old culverts. The bridges will easily handle a 100 year+ flood. In the event of still higher flows, the bridges are designed to withstand overtopping.

The GRMW and Wallowa County Public Works will monitor natural reestablishment of vegetation in the area of the detour bypasses, and any changes in channel morphology or movement of riprap.

Lessons Learned

The project reinforced several experiences from past projects. Some of those were that money spent upfront to get a good design pays off during construction and likely well into the future, ie. bridge longevity. The mandatory pre-bid, on-site contractor meeting clarified construction specifications for all potential bidders and ensured fair and competitive bids.

Recommendations

Although we did not experience project implementation delays due to permitting or ESA Consultation, these requirements have a very real potential to delay projects. For projects requiring in-water fill or removal activities, and consequently regulatory permits, plan on submitting DSL and COE permit applications at least six months in advance of planned start work. If ESA consultation is necessary also plan on submitting the Biological Assessment six months in advance of work.

Appendix

Figure 1 Wildcat Vicinity map
Figure 2 Wallupa Vicinity map
Pre-project pictures
Construction pictures
Post-project pictures

Appendix

Figure 1 Wildcat Vicinity Map

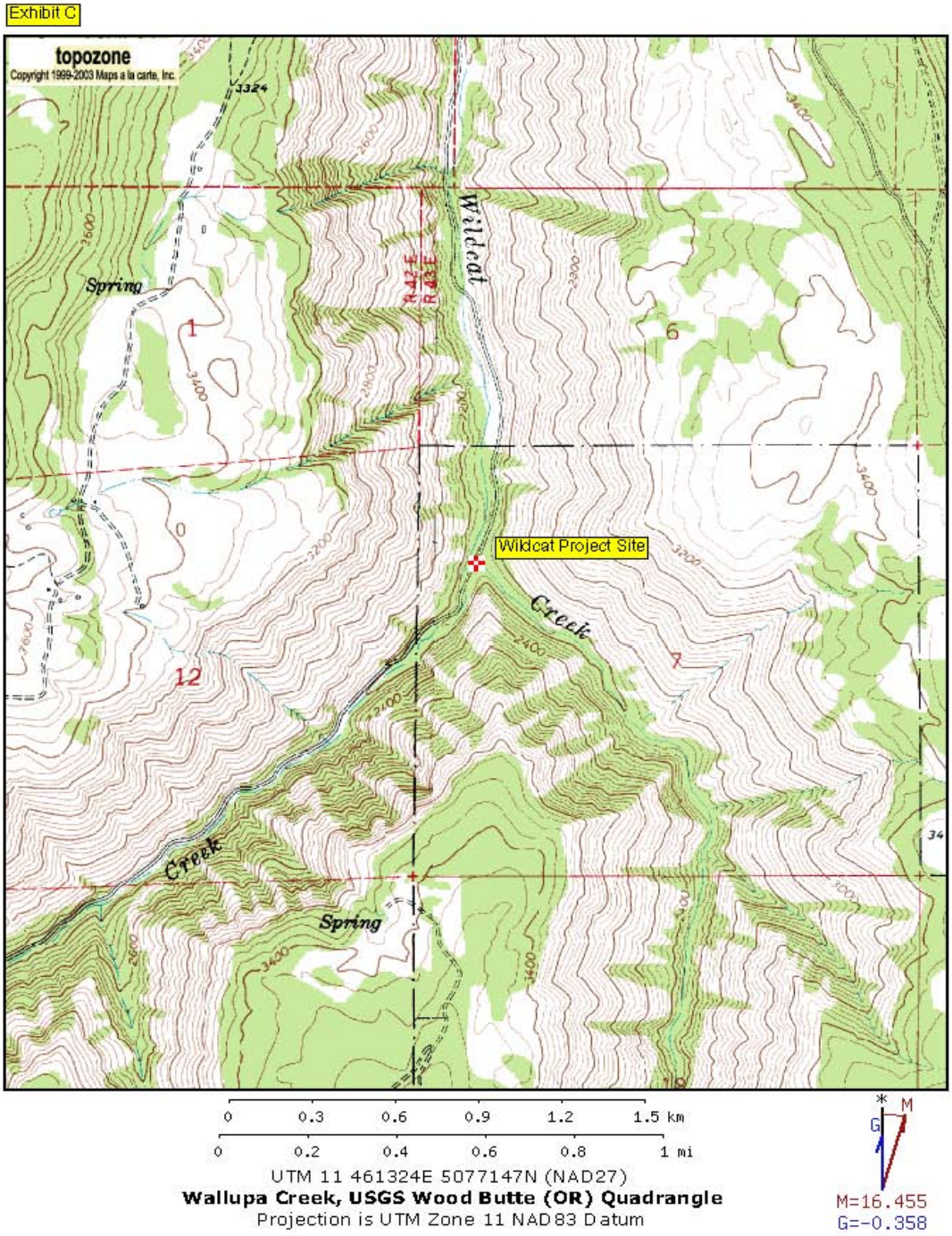
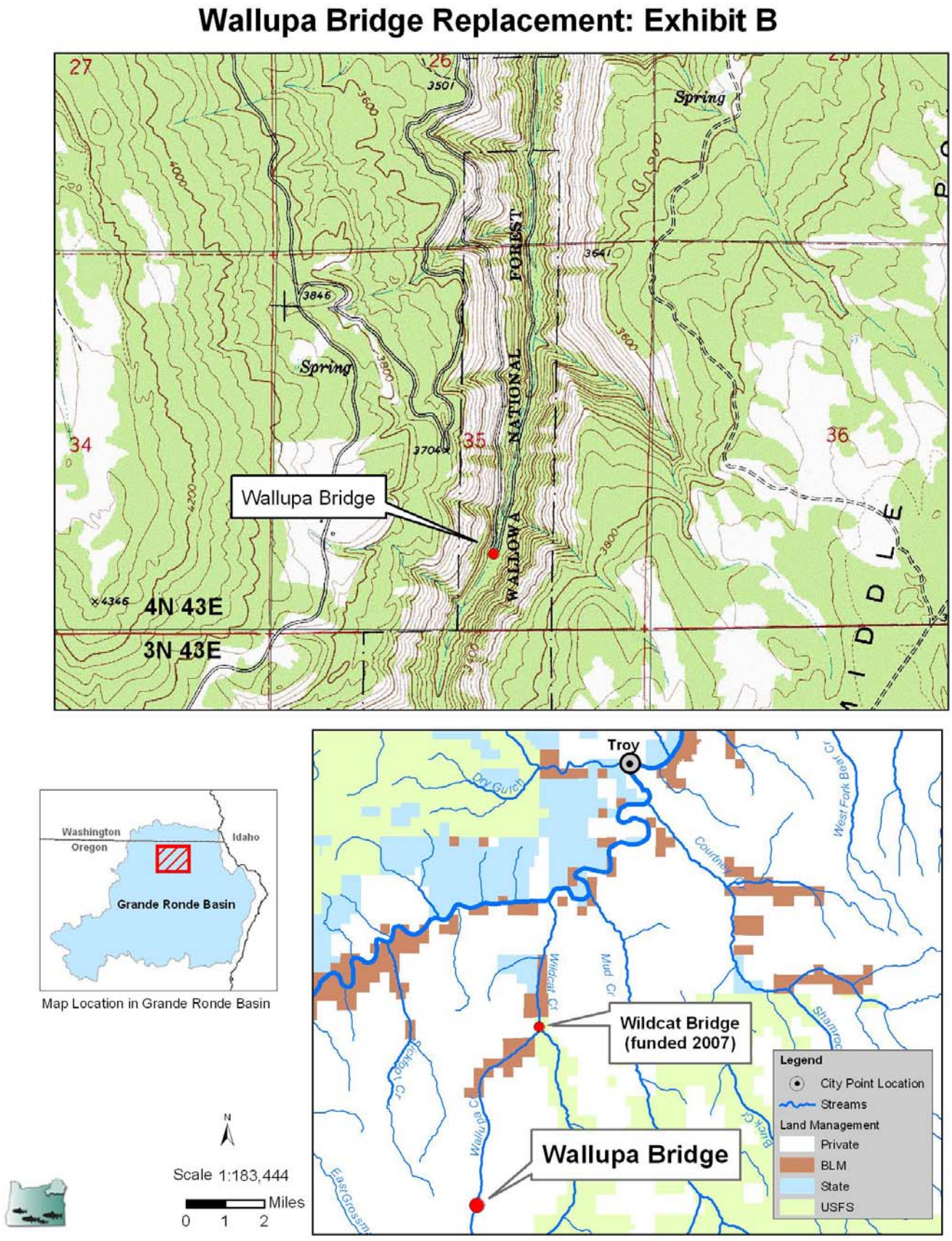


Figure 2 Wallupa Vicinity Map



Wildcat
Pre-Project

Upstream view, March 2005. Note the large rock partially blocking the entrance and the partially collapsed condition of the pipe. The width of the structure at the base is just under ten feet, severely undersized for the area of the Wildcat drainage.

Wildcat
During Construction

Upstream view, August 2008. The bridge foundation is in place. Riprap has been placed on the north side of the stream. Riprap was planned but not necessary on the south side due to very solid basalt rock from the waterline up to the foundation. The precast concrete slabs are being placed with cranes stationed on either side of the bridge.

Wildcat
Post-Project

Downstream view, November 2008. Completed bridge. Note riprap was only necessary on the right streambank. Flow capacity is nearly four times pre-project.

Wallupa
Pre-Project

Upstream view, May 2008. Velocity through the pipe, pipe slope and pipe length, and drop at the outlet combined to restrict adult migration as well as prohibit any upstream juvenile passage.

Wallupa
During Construction

Upstream view, August 2008. The bridge foundation is in place. Riprap has been placed to armor the bridge footings. Accumulated bedload from above the site has been placed throughout the channel bed.

Wallupa
Post-Project

Upstream view, November 2008. Completed bridge. Live stream flow is perennial higher in the drainage. Flow at the project site normally resumes in December. Flow capacity is nearly four times pre-project.