

RECLAMATION

Managing Water in the West

Bureau of Reclamation's 2011 List of Tributary Habitat Projects Completed for the 2010 Federal Columbia River Power System Biological Opinion



U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Columbia/Snake River Office
Boise, Idaho

May 2012

MISSION OF THE U.S. DEPARTMENT OF THE INTERIOR

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

MISSION OF THE BUREAU OF RECLAMATION

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Photograph on front cover: View of the Upper Chumstick Barriers Project where the upper barrier was replaced with a weir to accommodate fish passage, looking downstream.

RECLAMATION

Managing Water in the West

Bureau of Reclamation's
2011 List of Tributary Habitat Projects
Completed for the 2010 Federal Columbia
River Power System Biological Opinion



U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Columbia/Snake River Office
Boise, Idaho

May 2012

Table of Contents

Introduction.....	1
2011 Activities	4
Future Projects	4
Acknowledgements	5
Salmon River Basin.....	6
Lemhi River Subbasin	7
Archie Lane Culvert Replacement Project.....	10
Lower Big Timber Creek Reconnection/Flow Project	13
Lower Lemhi River Bank Stabilization Project	15
L-52 Ditch Closure Project	18
Lemhi River Multi-Landowner Bank Stabilization Project	21
Lemhi River Channel Relocation Project	24
L-52 Removal Project	28
Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation Project	31
Parmenter Lane Culvert Replacement Project	34
Canyon Creek Reconnect/Flow Project	37
Wallace Creek Culvert Replacement Project.....	39
Wimpey Creek 2 Diversion Replacement Project	42
Pahsimeroi River Subbasin	46
Hooper Lane Culvert Replacements Project	48
Muddy Springs Creek Lower Culvert Replacement Project.....	54
Upper Salmon River Subbasin.....	57
Bayhorse Creek Division Removal Project.....	59
John Day River Basin	61
Middle Fork John Day River Subbasin	62
Oxbow Conservation Area Dredge Tailings Restoration Project, Phase I.....	64
Upper John Day River Subbasin	68
Dads Creek #2 Winegar Diversion Project	71
Dads Creek #3 CTWSRO Diversion Project	74

Dads Creek Diversions #4 and #5 Project	77
East Fork Canyon Creek Diversion Project	81
Edigar Habitat Improvement Project	84
Mark Lawrence Reynolds Creek Diversion Project	86
Lower Deardorff Creek Diversion Project.....	89
Upper Deardorff Creek Diversion Project	92
Reynolds Slough Ditch Diversion Project	95
Upper Columbia River Basin.....	98
Entiat River Subbasin.....	99
ARRA Wells Project.....	101
Ecology Wells Project.....	105
Preston Reach Project	108
Methow River Subbasin	112
Beaver Creek, Gold Creek, and Middle Methow Tributary Instream Flow Enhancement Project	115
Wenatchee River Subbasin	118
Peshatin Pipeline, Sechedules A and B	120
Upper Chumstick Barriers Project	123

List of Figures

Figure 1. Map of 2011 Supplemental Federal Columbia River Power System Biological Opinion tributary subbasins with Reclamation involvement.....	2
Figure 2. Location map of the projects completed in the Lemhi River subbasin in 2011.	9
Figure 3. Location map of the projects completed in the Pahsimeroi River subbasin in 2011.	47
Figure 4. Location map of the project completed in the Middle Fork John Day River subbasin in 2011.	63
Figure 5. Location map of the projects completed in the Upper John Day River subbasin in 2011.....	70
Figure 6. Location map of the projects completed in the Entiat River subbasin in 2011.....	100
Figure 7. Location map of the projects completed in the Methow River subbasin in 2011.	114
Figure 8. Location map of the projects completed in the Wenatchee River subbasin in 2011.	119

INTRODUCTION

The Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers, and Bonneville Power Administration contribute to the implementation of salmonid habitat improvement projects in Columbia River Basin tributaries to help meet commitments in the 2010 Supplemental Federal Columbia River Power System Biological Opinion (FCRPS BiOp).¹ The FCRPS BiOp includes a Reasonable and Prudent Alternative (RPA), or a suite of actions, to protect salmon and steelhead listed under the Endangered Species Act (ESA) across their life cycle. Reclamation's contributions to habitat improvement are all meant to be within the framework of the Federal Columbia River Power System RPA or related commitments. This document covers only Reclamation habitat improvements.²

ESA-listed fish species present in the Columbia River Basin include Upper Columbia River spring Chinook salmon (*Oncorhynchus tshawytscha*) (endangered), Mid-Columbia River spring Chinook salmon (*O. tshawytscha*) (threatened), Snake River (SR) spring/summer Chinook salmon (*O. tshawytscha*) (threatened), steelhead trout (*O. mykiss*) (threatened), SR sockeye salmon (*O. nerka*) (endangered), and Upper Columbia River bull trout (*Salvelinus confluentus*) (threatened). Pacific lamprey (*Entosphenus tridentatus*) are not ESA-listed, but are afforded actions through commitments in the 2008 Fish Accords agreement with the Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation.

Habitat improvement projects in various Columbia River tributaries are one aspect of the RPA. Rehabilitation or improvement of altered stream habitat and formation of new habitat are generally accepted methods that benefit fish populations. Reclamation conducts tributary and reach assessments in river subbasins specified in the FCRPS BiOp to maximize the success of habitat improvement projects benefiting anadromous species listed under the ESA (Figure 1). These assessments analyze the physical and ecological processes at work in the watershed and define environmental baseline conditions that can complement monitoring activities designed to evaluate the physical and biological responses to the improvement projects.

¹ National Marine Fisheries Service, Supplemental Consultation on Remand for Operation of the Federal Columbia River Power System, 11 Bureau of Reclamation Projects in the Columbia Basin and ESA Section 10(a)(1)(A) Permit for Juvenile Fish Transportation Program, May 20, 2010, F/NWR/2010/02096. The 2010 BiOp incorporates in whole the 2008 BiOp: *Consultation on Remand For Operations of the Federal Columbia River Power System, 11 Bureau of Reclamation Projects in the Columbia Basin and ESA Section 10(a)(1)(A) Permit for Juvenile Fish Transportation Program* [Revised and reissued pursuant to court order, *NWF v. NMFS*, Civ No. CV 01-0640-RE (D. Oregon).

² For more information see www.salmonrecovery.gov.



Figure 1. Map of 2011 Supplemental Federal Columbia River Power System Biological Opinion tributary subbasins with Reclamation involvement.

Reclamation provides technical assistance to States, Tribes, Federal agencies, and other local partners for identification, design, and construction of stream habitat improvement projects that primarily address streamflow, access, entrainment, and channel complexity limiting factors. Approximately 20 to 30 projects are completed annually at a total cost to Reclamation ranging from \$7.0 to \$9.0 million, with 60 to 80 projects in different stages of development during any year. Habitat improvement projects may take up to 3 years or more to implement from conception to completion. Construction activities associated with the more complex and costly projects usually continue across multiple years. Project costs vary, depending on the objectives, landowner cooperation, availability of construction funding from project partners, changes in project scopes, and other actions required to meet biological criteria in the FCRPS BiOp for endangered species.

Reclamation does not own, operate, or maintain the habitat improvement projects described in this report, and does not engage in project-level effectiveness monitoring in these subbasins. Reclamation's role in these projects is providing technical assistance such as assessing, modeling, designing, and verifying designs so that the projects are sound from an engineering perspective and should perform hydraulically as intended. For continual improvement of project designs, Reclamation evaluates completed projects to determine if they are functioning as designed and incorporates the findings in future projects.

Projects described in this report are completed with contributions from many partners. Full descriptions of the projects and associated benefits are presented in this report even if Reclamation did not contribute to a particular project element. Consequently, benefits identified in this report are more comprehensive than the benefits that were reported by Reclamation in the FCRPS BiOp annual progress reports. Descriptions in this report also include partner objectives that often target restoration goals that are broader than the goals Reclamation addresses to implement the FCRPS BiOp.

Expenditures for the total basin costs are included in each basin section and repeated for each subbasin. Those totals include the annual budgets spent for development, coordination, financial assistance to partners, contracts for architectural and engineering services, and project-specific activities for 2011 only. With 60 to 80 projects in different stages of development during each year, the development costs will not equal the expenditures for the basin in any given year. The development costs shown for each individual project include all years of project development summarized for the Reclamation contribution. Implementation costs that are given in this report are costs incurred by the partners, including construction of the specific project.

2011 Activities

In 2011, 31 fish habitat improvement projects were completed in the following 8 subbasins of the Columbia River Basin:

- Lemhi River
- Pahsimeroi River
- Upper Salmon River
- Middle Fork John Day River
- Upper John Day River
- Entiat River
- Methow River
- Wenatchee River

Objectives of the projects included, but were not limited to, removal of fish passage barriers; the redesign of irrigation structures to allow fish passage; the construction of engineered log jams to create pools and fish cover; and the improvement or construction of side-channel fish habitat.

In 2011, work was performed in the Grande Ronde River subbasin, but no projects were completed; consequently, that subbasin is not included in this report.

Future Projects

Reclamation plans to continue providing technical assistance for habitat improvement projects that enhance tributary spawning and rearing habitat associated with implementing the FCRPS BiOp. Reach assessment analyses are currently being conducted for Catherine Creek in the Grande Ronde River subbasin, Yankee Fork of the Salmon River subbasin, and the Lower Entiat River in the Entiat River subbasin. These assessments will be used to refine the designs for the proposed fish habitat rehabilitation projects in those subbasins.

Reclamation will continue to assist non-Federal parties located in Idaho, Oregon, and Washington in complying with environmental and cultural resources regulations and producing engineering designs related to barrier removals, screens, and channel morphology (e.g., blockages, floodplains, and culverts) associated with implementing the FCRPS BiOp.

Acknowledgements

The major credit for the success to date of Reclamation's efforts to implement the FCRPS BiOp is due to the participation and cooperation of many partners, including landowners, local and State agencies, Tribes, non-profit organizations, interest groups, and other Federal agencies. Reclamation activities undertaken through this program support a larger, cooperative process which is generally controlled by non-Federal partners who secure funding and implement the habitat improvement projects that address water, land, and other resource management challenges. Some provide their resources of time and money for a single project; others for multiple projects throughout the subbasins. In the following sections, partners and sponsors for the 2011 projects are listed under each subbasin in which they were active.

SALMON RIVER BASIN

From its headwaters in the Sawtooth Mountains, the Salmon River flows northerly about 180 miles (joined by the North Fork at RM 237), and then heads westerly across central Idaho until it enters the Snake River at RM 188. The Salmon River subbasin drains approximately 14,000 square miles from elevations exceeding 10,000 feet to approximately 900 feet at its confluence with the Snake River. The Salmon River is the second longest undammed river in the Columbia River Basin. Reclamation works in four subbasins: the Upper Salmon, the Lemhi, the Pahsimeroi, and the Little Salmon. In 2011, 12 projects were completed in the Lemhi River subbasin, 2 were completed in the Pahsimeroi River subbasin, and 1 project was completed in the Upper Salmon River subbasin.

ESA-listed fish species present in the Salmon River include SR spring/summer Chinook salmon (threatened), SR steelhead trout (threatened), SR sockeye salmon (endangered), and Columbia River bull trout (threatened).

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Upper Salmon River	\$633,995
Pahsimeroi River	\$196,825
Lemhi River	\$525,057
Total	\$1,355,877

LEMHI RIVER SUBBASIN

The Lemhi River (HUC 17060204) is a tributary to the Salmon River, entering it at RM 258.5, and has a drainage area of about 1,270 square miles. In 2011, 12 projects were completed in the subbasin that improved fish passage, habitat access, flows, channel complexity, and tributary reconnections, and removed barriers and entrainment potential.

ESA-listed fish species present in the river include SR spring/summer Chinook salmon (threatened), SR steelhead trout (threatened), SR sockeye salmon (endangered), and Columbia River bull trout (threatened).

Projects

- Archie Lane Culvert Replacement Project
- Lower Big Timber Creek Reconnection/Flow Project
- Lower Lemhi River Bank Stabilization Project
- L-52 Ditch Closure Project
- Lemhi River Multi-Landowner Bank Stabilization Project
- Lemhi River Channel Relocation Project
- L-52 Removal Project
- Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation Project
- Parmenter Lane Culvert Replacement Project
- Canyon Creek Reconnect/Flow Project
- Wallace Creek Culvert Replacement Project
- Wimpey Creek 2 Diversion Replacement Project

Sponsors

- Lemhi Soil and Water Conservation District (LSWCD)
- Idaho Department of Fish & Game (IDFG)
- The Nature Conservancy (TNC)
- Trout Unlimited

Partners

- Private landowners
- Irrigators
- Bonneville Power Administration (BPA)
- LSWCD
- Idaho Department of Agriculture (IDA)
- Idaho Department of Fish and Game (IDFG)
- State of Idaho, Office of Species Conservation (OSC)
- Upper Salmon Basin Watershed Program (USBWP)
- Idaho Department of Water Resources (IDWR)
- Natural Resources Conservation Service (NRCS)
- The Nature Conservancy (TNC)
- Trout Unlimited
- NOAA Fisheries Service
- Lemhi County
- Aspect Consulting

Funding Sources

- BPA
- NOAA Fisheries Service
- State of Idaho
- Landowners
- Trout Unlimited
- Pacific Coastal Salmon Recovery Fund (PCSRF)
- Mitchell Act

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Lemhi River	\$525,057

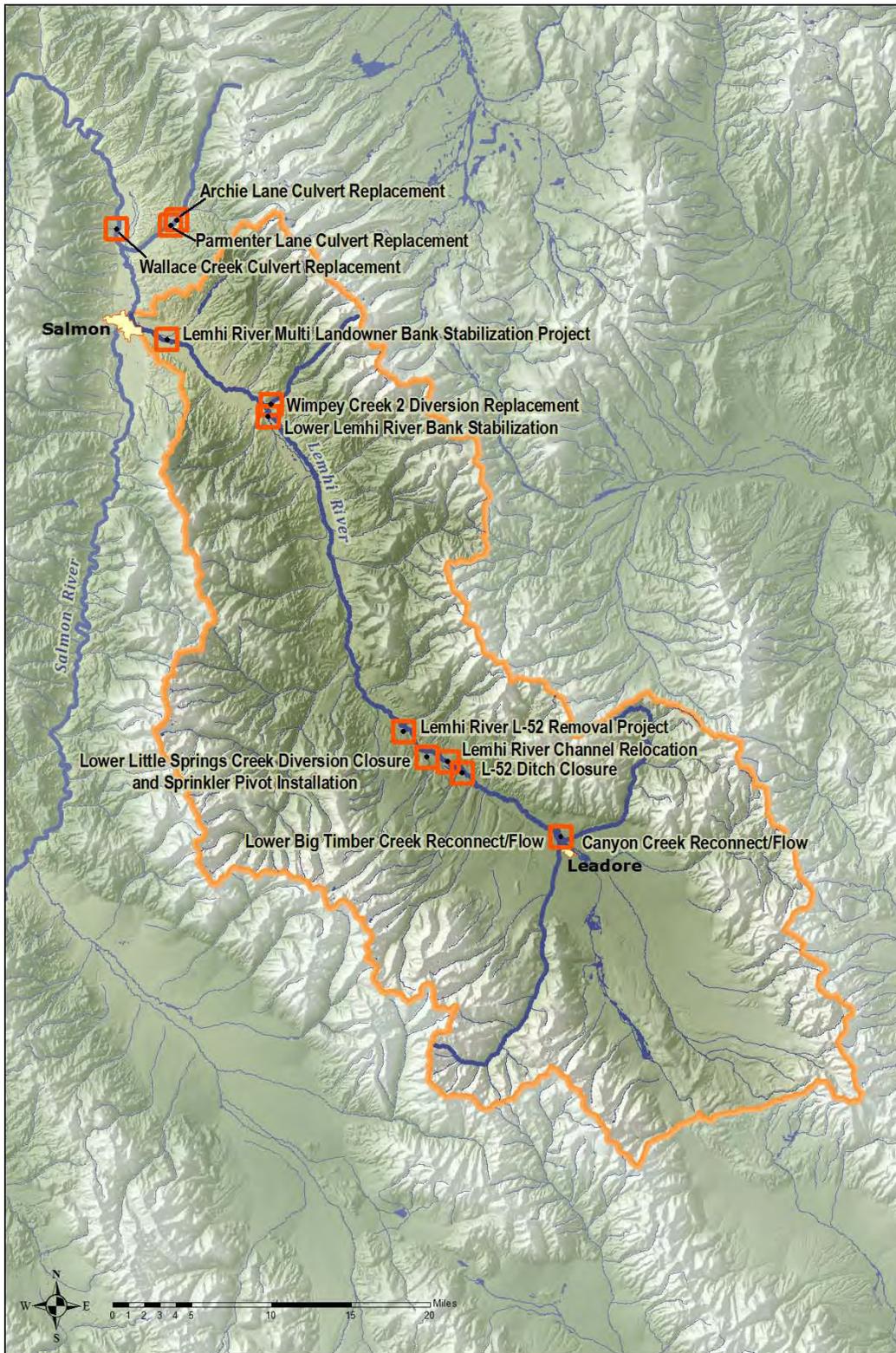


Figure 2. Location map of the projects completed in the Lemhi River subbasin in 2011.

Archie Lane Culvert Replacement Project

Project Name: Archie Lane Culvert Replacement	
Project Type: Barrier	
Project Sponsor: LSWCD	
Project Design: IDA	
Landowner(s): Private landowner	
Partners: BPA, LSWCD, IDA, OSC, USBWP, Landowner	Reclamation Development Costs: \$2,500
Funding Source(s): BPA	Implementation Cost: \$86,907
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Carmen Creek <i>Latitude:</i> 45 16' 14.56 N <i>Longitude:</i> 113 49' 36.62" W <i>Local Landmark:</i> Archie Lane <i>Township:</i> 23N <i>Range:</i> 22E <i>Section:</i> 35 <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Complete	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> September 2011 <i>Construction Completion Date:</i> October 2011
Contracting	<i>Advertised:</i> August 2011
	<i>Awarded:</i> September 2011
Biological Benefit	<i>Species:</i> Chinook salmon, steelhead, bull trout
	<i>Benefit Type:</i> Fish passage and habitat access
Metric: 0.65 miles made accessible	
Project Objectives and Description: The objective of the project was to improve fish passage in Carmen Creek. Archie Lane is a private access road. Two CMP culverts conveyed Carmen Creek under the road and were identified by IDFG as being undersized and potential fish migration barriers due to excessive water velocities. The culverts were removed and replaced with a 24-foot by 50-foot prefabricated steel bridge.	

Project Name: Archie Lane Culvert Replacement

Design, Permitting, and Construction Issues:

LSWCD and OSC administered the BPA funding and managed construction. The bridge design was completed by the IDA. The USBWP coordinated the project and completed environmental compliance for BPA. Reclamation provided technical assistance to USBWP by providing the cultural resource survey and SHPO clearance process.

Gallery:



Archie Lane Culvert Replacement Project: view of culverts before project from downstream.



Archie Lane Culvert Replacement Project: view of Archie Lane Bridge after project from downstream.

Lower Big Timber Creek Reconnection/Flow Project

Project Name: Lower Big Timber Creek Reconnect/Flow	
Project Type: Flow and Screening	
Project Sponsor: IDFG	
Project Design: IDFG, NRCS	
Landowner(s): Private landowner	
Partners: Landowner, IDFG, NRCS, IDWR, OSC	Reclamation Development Costs: \$5,000
Funding Source(s): NOAA Fisheries Service (PCSRF and Mitchell Act), State of Idaho, BPA, Landowner	Implementation Cost: \$124,521.00
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Canyon Creek <i>Latitude:</i> 44° 41' 38.83" N <i>Longitude:</i> 113° 22' 3.79" W <i>Local Landmark:</i> 3500 ft NW of Leadore, Idaho at RM 0.66 <i>Township:</i> 16N <i>Range:</i> 26E <i>Section:</i> 28 <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Complete	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> August 2010 <i>Construction Completion Date:</i> April 2011
Contracting	<i>Advertised:</i>
	<i>Awarded:</i>
Biological Benefit	<i>Species:</i> Chinook salmon, steelhead and bull trout
	<i>Benefit Type:</i> Flow enhancement and habitat access
Metric: 1.4 cfs; 1.0 miles affected	
Project Objectives and Description: The objectives of this project were to provide 1.4 cfs flow to a historically dewatered segment of lower Big Timber Creek and improve migratory conditions and access to previously unavailable good quality habitat for spawning and rearing. The project entailed transfer of water rights and a point of diversion from a diversion on Lower Big Timber Creek (BT-1) to a new point-of-diversion location on the Lemhi River where a weir, pump station, and fish screen were constructed to allow	

Project Name: Lower Big Timber Creek Reconnect/Flow

for diversion / screening of irrigation water and conveyance to the original place of use. The result being elimination of the lower point of diversion on Big Timber Creek and improved efficiency in delivery of irrigation water, elimination of entrainment, access to habitat, and greater assurance of flow remaining in the lower reach of Big Timber Creek downstream to the confluence with the Lemhi River. (Note: The diversion facility/pump station constructed on the Lemhi River for this project was also utilized for a similar project involving transfer of water rights from lower Canyon Creek to the Lemhi and pumping of irrigation water).

Design, Permitting, and Construction Issues:

A variety of funding sources were utilized in development and implementation of this project including NOAA Fisheries Service (PCSRF and Mitchell Act), BPA/IDWR Water Transaction Program, State of Idaho (IDFG/IDWR), and the landowner. IDFG led the coordination effort, served as project sponsor administering funding along with OSC. IDFG also managed construction. Environmental compliance and acquisition of permits was completed by IDFG. IDFG and the Natural Resources Conservation Service (NRCS) developed the project design. Flow data acquired by Reclamation during a PHABSM Flow study conducted in Big Timber Creek was provided to IDFG in 2004 for use in the planning and design.

Gallery:



Lower Big Timber Creek Reconnect/Flow Project: lower Big Timber Creek/Lower Canyon Creek Pump Station on the Lemhi River.

Lower Lemhi River Bank Stabilization Project

Project Name: Lower Lemhi River Bank Stabilization Project	
Project Type: Channel Complexity	
Project Sponsor: IDFG	
Project Design: Quadrant Consulting and IDFG	
Landowner(s): Private landowner	
Partners: OSC, IDFG, BPA, NOAA Fisheries Service, Landowner	Reclamation Development Costs: \$2,500
Funding Source(s): NOAA Fisheries Service (PCSRF) and BPA	Implementation Cost: \$61,369.00
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Lemhi River <i>Latitude:</i> 45° 05' 18.77" N <i>Longitude:</i> 113 43' 12.12"W <i>Local Landmark:</i> Baker <i>Township:</i> 20N <i>Range:</i> 23E <i>Section:</i> 10 <i>¼ Section:</i> NE
Project Status: Complete	
Project Phase: Complete	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> May 2011 <i>Construction Completion Date:</i> December 2011
Contracting	<i>Advertised:</i> April 2011
	<i>Awarded:</i> April 2011
Biological Benefit	<i>Species:</i> Chinook salmon, steelhead, bull trout
	<i>Benefit Type:</i> Improve channel complexity
Metric: 0.5 miles of channel complexity	
Project Objectives and Description: <p>The objective of the project was to improve fish spawning and rearing habitat in the lower Lemhi River. The project was completed in two phases: Phase1 entailed excavation and burial of 200 linear feet of rock in a trench along the river bank to prevent lateral migration of the river. Phase 2 entailed the addition of bioengineering techniques to prevent lateral migration of the river, stop erosion, enhance fish habitat, and relocation (setback) of an earthen berm to provide increased floodplain connectivity. Bioengineering techniques employed included placement of root wads and planting of riparian vegetation. Riparian fencing will be constructed by the landowner to exclude cattle from the streambank and protection of riparian habitat.</p>	

Project Name: Lower Lemhi River Bank Stabilization Project

Design, Permitting, and Construction Issues:

Project funding was provided by the NOAA Fisheries Service and BPA. Funding was administered by IDFG and OSC. The IDFG coordinated with landowners, completed environmental compliance and managed construction. Reclamation provided technical assistance to the IDFG by providing the cultural resource survey and SHPO clearance process.

Gallery:



Lower Lemhi River Bank Stabilization Project: the lower Lemhi River streambank before stabilization.



Lower Lemhi River Bank Stabilization Project: the lower Lemhi River streambank after stabilization and earthen berm relocation.

L-52 Ditch Closure Project

Project Name: L-52 Ditch Closure	
Project Type: Flow, barrier, screen	
Project Sponsor: TNC	
Project Design: TNC	
Landowner(s): Private landowners and BLM	
Partners: TNC, Landowners, Irrigator, NOAA Fisheries Service, OSC	Reclamation Development Costs: \$12,000
Funding Source(s): NOAA Fisheries Service (PCSRF), Cost Share	Implementation Cost: \$21,339.00
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Lemhi River <i>Latitude:</i> 44° 45' 24.4" N <i>Longitude:</i> 113° 29' 23.4" W <i>Local Landmark:</i> Lemhi River, Mill Creek, Little Springs Creek <i>Township:</i> 17N <i>Range:</i> 25E <i>Section:</i> 3 <i>¼ Section:</i>
Project Status: Completed	
Project Phase: Monitoring	
Milestones	Funding: Secured Design: Completed Permitting: Completed Construction Start Date: August 8, 2011 Construction Completion Date: August 13, 2011
Contracting	Advertised: August 2011
	Awarded: August 2011
Biological Benefit	Species: Chinook salmon, steelhead, bull trout
	Benefit Type: Instream flow, passage, entrainment, tributary reconnection
Metric: Permanent closure of the L-52 diversion ditch. Add 1.5 cfs flow in lower Mill Creek, reconnection Mill Creek with Little Springs Creek and provide 1.1 mile of improved fish access to habitat in Mill Creek, remove diversion barrier in Little Springs Creek. and improve fish access to 1.9 miles of habitat, and permanent closure of the L-52 secondary ditch. The flow in the eight ephemeral drainages that were directed to the L-52 ditch now flow unimpeded to the Lemhi River.	

Project Name: L-52 Ditch Closure

Project Objectives and Description:

The L-52 Ditch Closure Project was a follow up to the Lemhi River, L-52 Removal Project completed in the spring of 2011. Upon completion of the L-52 Removal Project, problems associated with the abandoned 7-mile-long ditch still existed. TNC worked with the irrigator and various private landowners, BLM, and local, State, and Federal agencies to remove the headgate and permanently close the L-52 Ditch at the point of diversion and at primary and secondary points of diversion at Little Springs Creek and Mill Creek. This resulted in removal of a diversion structure in Little Springs Creek and reconnection of Mill Creek to Little Springs Creek. In addition, ditch embankments were breached to reestablish unimpeded flow to eight ephemeral drainages that were intercepted by the L-52 ditch.

Design, Permitting, and Construction Issues:

No major issues were encountered during development or construction of the project. TNC developed and designed the project and coordinated with the irrigator, various landowners, agencies, and technical groups. Reclamation provided technical assistance to TNC with environmental compliance and provided LiDAR data for use in development of design.

Funding was administered by TNC and OSC. Tyler Excavation completed construction. The irrigator also assisted with construction and provided equipment. Contract administration, construction oversight, and site revegetation were completed by TNC.

Gallery:



L-52 Ditch Closure Project: secondary L-52 point of diversion in Little Springs Creek before removal of headgate/diversion.



L-52 Ditch Closure Project: secondary L-52 point of diversion after removal of headgate/diversion and the ditch closed.

Lemhi River Multi-Landowner Bank Stabilization Project

Project Name: Lemhi River Multi-Landowner Bank Stabilization Project	
Project Type: Channel Complexity	
Project Sponsor: Trout Unlimited	
Project Design: IDFG	
Landowner(s): Private landowners	
Partners: OSC, IDFG, NOAA Fisheries Service, Landowners, Trout Unlimited, Aspect Consulting	Reclamation Development Costs: \$8,000
Funding Source(s): NOAA Fisheries Service (PCSRF), Landowners, Trout Unlimited	Implementation Cost: \$170,000
Project Location:	<p><i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Lemhi River -3 miles from confluence with Salmon River</p> <p><i>Latitude:</i> 45° 9' 42.16" N <i>Longitude:</i> 113° 50' 43.9" W</p> <p><i>Local Landmark:</i> Salmon</p> <p><i>Township:</i> 21N <i>Range:</i> 22E <i>Section:</i> 10 <i>¼ Section:</i></p>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: October 4, 2011</p> <p>Construction Completion Date: November 17, 2011</p>
Contracting	Advertised: 2011
	Awarded: April 2011
Biological Benefit	Species: Chinook salmon, steelhead, bull trout
	Benefit Type: Channel complexity
Metric: 351 feet of streambank stabilized and enhanced rearing habitat	
<p>Project Objectives and Description:</p> <p>The objective of the project was to improve fish spawning and rearing habitat and stabilize 351 feet of eroding river bank to prevent lateral migration of the river. Work entailed the application of bioengineering techniques to armor the streambank/stop erosion, and enhance fish habitat. In addition, an existing nonfunctional levee was removed to provide increased floodplain connectivity.</p>	

Project Name: Lemhi River Multi-Landowner Bank Stabilization Project

Bioengineering techniques employed included placement of root wads, J Hook rock vane, and planting of riparian vegetation. An irrigation ditch was relocated and a fence line set back to exclude cattle from access to the streambank and protect additional riparian habitat.

Design, Permitting, and Construction Issues:

Project funding was provided by NOAA Fisheries Service, with cost share and labor provided by the landowners and Trout Unlimited. Funding was administered by Trout Unlimited and OSC. The IDFG designed the project. Trout Unlimited coordinated with landowners, completed environmental compliance, and managed construction. Reclamation provided technical assistance to the Trout Unlimited by completing the cultural resource survey and SHPO clearance process, attaining permits, and submitting LiDAR data to IDFG for use in project design.

Gallery:



Lemhi River Multi-Landowner Bank Stabilization Project: the streambank before stabilization.



Lemhi River Multi-Landowner Bank Stabilization Project: the streambank after the stabilization project.

Lemhi River Channel Relocation Project

Project Name: Lemhi River Channel Relocation Project	
Project Type: Channel Complexity	
Project Sponsor: IDFG	
Project Design: IDFG	
Landowner(s): Private landowners	
Partners: OSC, Landowners, IDFG	Reclamation Development Costs: \$5,000
Funding Source(s): NOAA Fisheries Service (PCSRF), BPA	Implementation Cost: \$672,000 (Approximate)
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Lemhi River <i>Latitude:</i> 44° 46' 1.79" N <i>Longitude:</i> 113° 30' 29.65" W <i>Local Landmark:</i> Approx. 10 miles south of Leadore <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Complete	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> May 2011 <i>Construction Completion Date:</i> August 2011
Contracting	<i>Advertised:</i> March 2011
	<i>Awarded:</i> April 2011
Biological Benefit	<i>Species:</i> Chinook salmon, steelhead, bull trout
	<i>Benefit Type:</i> Improve channel complexity
Metric: 0.5 miles of habitat complexity	
Project Objectives and Description: The objective of the project was to improve floodplain connectivity, riparian condition, and fish habitat complexity and ultimately increase available spawning/rearing habitat. The project entailed construction of 3,112 feet of new river channel to replace 2,051 feet of river channel that had historically been straightened, diked, perched, and overgrazed by livestock. Approximately 700 feet of backwater rearing habitat was also created within the old channel alignment. A bridge was constructed over the new channel for access. Sod and riparian vegetation was planted along	

Project Name: Lemhi River Channel Relocation Project

streambanks, disturbed areas were hydroseeded, and riparian fencing was constructed to exclude livestock.

Design, Permitting, and Construction Issues:

Project funding was provided by the NOAA Fisheries Service and BPA. Funding administration was provided by IDFG and OSC. The IDFG coordinated with landowners, completed environmental compliance, and managed construction. Reclamation provided technical assistance to the IDFG by providing LiDAR data for use in project planning and design.

Gallery:



Lemhi River Channel Relocation Project: view of the old Lemhi River channel (upper end).



Lemhi River Channel Relocation Project: view of the old Lemhi River channel (lower end).



Lemhi River Channel Relocation Project: the new constructed Lemhi River channel.



Lemhi River Channel Relocation Project: the bridge constructed over the new Lemhi River channel.



Lemhi River Channel Relocation Project: the new Lemhi River channel.

L-52 Removal Project

Project Name: Lemhi River - L-52 Removal Project (POD Transfer, Pipeline, Pivots)	
Project Type: Flow	
Project Sponsor: LSWCD	
Project Design: NRCS	
Landowner(s): Private landowners, Bureau of Land Management	
Partners: TNC, Landowners, Irrigators, BPA, USBWP, OSC, IDWR, LSWCD	Reclamation Development Costs: \$18,258.50
Funding Source(s): BPA	Implementation Cost: \$350,000
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Lemhi River <i>Latitude:</i> 44° 47' 47" N <i>Longitude:</i> 113° 33' 47.7" W <i>Local Landmark:</i> Lemhi River <i>Township:</i> 24E <i>Range:</i> 17N <i>Section:</i> 24 ¼ <i>Section:</i> NW
Project Status: Completed	
Project Phase: Completed	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> April 2011 <i>Construction Completion Date:</i> May 2011
Contracting	<i>Advertised:</i> March 2011
	<i>Awarded:</i> April 2011
Biological Benefit	<i>Species:</i> Chinook salmon, steelhead, bull trout
	<i>Benefit Type:</i> Instream flow, passage
Metric: 4.06 cfs increased flow in 6 miles of the Lemhi River	
Project Objectives and Description: The L-52 Diversion Removal Project entailed abandonment of the old point of diversion and transfer of a portion of the Lemhi River, L-52 Water Rights to a new point-of-diversion location 6 miles	

Project Name: Lemhi River - L-52 Removal Project (POD Transfer, Pipeline, Pivots)

downstream at the L-46A point of diversion. A pump station, three-phase power, and buried pipeline were installed to convey Lemhi River water from L-46A to pivots that were installed on ground formerly irrigated from L-52. Through a 20-year lease agreement between the irrigator and the IDWR Water Transaction Program, 4.06 cfs of unused L-52 water was placed in the Lemhi Water Bank for instream flow in the Lemhi River.

Design, Permitting, and Construction Issues:

The project was developed by TNC. Design was completed by the NRCS. Project coordination was completed by the USBWP. The LSWCD and OSC administered BPA funding. The LSWCD administered contracts and managed construction. The USBWP and BPA completed environmental compliance. Reclamation provided technical assistance to the USBWP and BPA by obtaining cultural resources clearance from the Idaho SHPO and providing LiDAR data for use with project planning and design.

Gallery:



Lemhi River L-52 Removal Project: sprinkler pipeline/pivot installation.



Lemhi River L-52 Removal Project: pump station in L-46A ditch.

Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation Project

Project Name: Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation	
Project Type: Passage, Flow	
Project Sponsor: LSWCD	
Project Design: NRCS	
Landowner(s): Private landowner	
Partners: LSWCD, BPA, OSC, USBWP, Landowner, Irrigators, NRCS	Reclamation Development Costs: \$7,500
Funding Source(s): BPA	Implementation Cost: \$294,931
Project Location:	<p>State: Idaho County: Lemhi Stream: Lemhi Tributary – Little Springs Creek</p> <p>Latitude: 44° 46' 20.29" N Longitude: 113° 32' 2.6" W</p> <p>Local Landmark: 10 miles north of Leadore</p> <p>Township: 17N Range: 24/25E Section: 25 /30 ¼ Section:</p>
Project Status: Complete	
Project Phase: Complete	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: April 2011</p> <p>Construction Completion Date: May 2011</p>
Contracting	Advertised: February 2011
	Awarded: March 2011
Biological Benefit	Species: Chinook salmon, steelhead, bull trout
	Benefit Type: Fish passage and stream flow
Metric: 0.7 miles affected; 15.9 cfs flow increase in Lower Little Springs Creek and Lemhi River	
Project Objectives and Description:	
The objective of the project was to eliminate three gravity diversions in Lower Little Springs Creek to improve fish passage and stream flow. Water rights from three Little Springs irrigation diversions	

Project Name: Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation

(LSC -1,2,3) were transferred to a Lemhi River Diversion (L-48) where a pump station was installed behind the fish screen. A buried pipeline now conveys Lemhi River water from the pump to pivots that irrigate approximately 140 acres of land formerly flood irrigated from Little Springs Creek.

Design, Permitting, and Construction Issues:

NRCS completed project design. LSWCD/OSC administered BPA funding. LSWCD advertised/awarded construction contracts and managed construction. USBWP completed environmental compliance for BPA and project coordination. Reclamation provided technical assistance to USBWP/BPA by obtaining SHPO cultural resource clearance and providing LiDAR data for use in project design.

Gallery:



Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation Project: lower Little Springs pump station at L-48.



Lower Little Springs Creek Diversion Closure and Sprinkler Pivot Installation Project: lower Little Springs pivots.

Parmenter Lane Culvert Replacement Project

Project Name: Parmenter Lane Culvert Replacement	
Project Type: Barrier	
Project Sponsor: LSWCD	
Project Design: IDA	
Landowner(s): Lemhi County	
Partners: BPA,LSWCD,Lemhi County, IDA, OSC	Reclamation Development Costs: \$2,500
Funding Source(s): BPA	Implementation Cost: \$87,284.00
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Carmen Creek <i>Latitude:</i> 45° 15' 0.94" N <i>Longitude:</i> 113° 50' 0.08" W <i>Local Landmark:</i> Parmenter Lane <i>Township:</i> 22N <i>Range:</i> 22E <i>Section:</i> 3 <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Complete	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> <i>Construction Completion Date:</i>
Contracting	<i>Advertised:</i> March 2011
	<i>Awarded:</i> April 2011
Biological Benefit	<i>Species:</i> Chinook salmon, steelhead, bull trout
	<i>Benefit Type:</i> Fish passage
Metric: 0.60 miles made accessible	
Project Objectives and Description: <p>The objective of the project was to improve fish passage in Carmen Creek. Parmenter Lane is a county-maintained road. Two undersized CMP culverts conveyed Carmen Creek under the county road and were identified by IDFG as being undersized and potential fish migration barriers due to excessive water velocities. The culverts were removed and replaced with a 24-foot by 50-foot prefabricated steel bridge.</p>	

Project Name: Parmenter Lane Culvert Replacement

Design, Permitting, and Construction Issues:

LSWCD and OSC administered the BPA funding and managed construction. Design was completed by the IDA. Lemhi County Road/Bridge Department installed the bridge. The USBWP coordinated the project and completed environmental compliance for BPA. Reclamation provided technical assistance to USBWP by completing the cultural resource survey/SHPO clearance process.

Gallery:



Parmenter Lane Culvert Replacement Project: culvert outlets before project.



Parmenter Lane Culvert Replacement Project: Parmenter Lane Bridge after project completion.

Canyon Creek Reconnect/Flow Project

Project Name: Canyon Creek Reconnect/Flow	
Project Type: Flow and Screening	
Project Sponsor: IDFG	
Project Design: IDFG, NRCS	
Landowner(s): Private landowner	
Partners: Landowner, IDFG, NRCS, IDWR, OSC	Reclamation Development Costs: \$5,000
Funding Source(s): NMFS (PCSRF and Mitchell Act), State of Idaho, BPA, Landowner	Implementation Cost: \$242,478.00
Project Location:	<i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Canyon Creek <i>Latitude:</i> 44° 41' 38.83" N <i>Longitude:</i> 113° 22' 03.79" W <i>Local Landmark:</i> 3500 ft NW of Leadore, Idaho at RM 0.66 <i>Township:</i> 16N <i>Range:</i> 26E <i>Section:</i> 28 <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Complete	
Milestones	Funding: Secured Design: Completed Permitting: Completed Construction Start Date: August 2010 Construction Completion Date: April 2011
Contracting	Advertised:
	Awarded:
Biological Benefit	Species: Chinook salmon, steelhead, bull trout
	Benefit Type: Flow enhancement and habitat access
Metric: Fish screen installed to prevent entrainment and 4 cfs. enhancement flow/habitat access in 1.25 miles of lower Canyon Creek and 1 cfs per 1.0 miles of flow enhancement in the Lemhi River.	
Project Objectives and Description:	
<p>The objectives of this project were to provide 4 cfs flow to a historically dewatered segment of lower Canyon Creek and improve migratory conditions and access to previously unavailable good quality habitat for spawning and rearing. The project entailed transfer of water rights and a point of diversion from Canyon Creek to a new point-of-diversion location on the Lemhi River where a weir, pump station, and fish screen were constructed to allow for diversion/screening of irrigation water</p>	

Project Name: Canyon Creek Reconnect/Flow

and conveyance to the original place of use on Canyon Creek. The result being improved efficiency in delivery of irrigation water, elimination of entrainment, and greater assurance of flow remaining in Canyon Creek for fishery benefits. (Note: The diversion facility/pump station constructed on the Lemhi River for this project was also utilized for a similar project involving transfer of water rights from lower Big Timber Creek to the Lemhi River and pumping of irrigation water.)

Design, Permitting, and Construction Issues:

A variety of funding sources were utilized in development and implementation of this project including NOAA Fisheries Service (PCSRF and Mitchell Act), BPA/IDWR (Water Transaction Program), State of Idaho (IDFG/IDWR), and the landowner. IDFG led the coordination effort and served as project sponsor administering funding along with OSC. IDFG also managed construction. Environmental compliance and acquisition of permits was completed by IDFG. IDFG and NRCS developed the project design. Flow data acquired by Reclamation in 2006 as a result of a PHABSM study conducted in Canyon Creek was provided for use in the planning and design of this project.

Gallery:



Canyon Creek Reconnect/Flow Project: Canyon Creek pump station on the Lemhi River.

Wallace Creek Culvert Replacement Project

Project Name: Wallace Creek Culvert Replacement	
Project Type: Barrier	
Project Sponsor: LSWCD	
Project Design: Quadrant Consulting	
Landowner(s): Lemhi County	
Partners: LSWCD, OSC, USBWP, Lemhi County, NOAA Fisheries Service	Reclamation Development Costs: \$2,500
Funding Source(s): NOAA Fisheries Service (PCSRF), Lemhi County	Implementation Cost: \$112,257
Project Location:	<p><i>State:</i> Idaho <i>County:</i> Lemhi <i>Stream:</i> Salmon River Tributary (Wallace Creek)</p> <p><i>Latitude:</i> 45° 15' 51.37" N <i>Longitude:</i> 113° 54' 16.11" W</p> <p><i>Local Landmark:</i> Lower Diamond Creek Road</p> <p><i>Township:</i> 22N <i>Range:</i> 22E <i>Section:</i> 6 <i>¼ Section:</i></p>
Project Status: Complete	
Project Phase: Complete	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: August 2011</p> <p>Construction Completion Date: August 2011</p>
Contracting	Advertised: March 2011
	Awarded: April 2011
Biological Benefit	Species: Chinook salmon, steelhead, bull trout
	Benefit Type: Barrier removal and fish passage
Metric: 5 miles made accessible	
<p>Project Objectives and Description:</p> <p>Wallace Creek is a tributary to the Salmon River, the confluence being located approximately 7 miles north of Salmon, Idaho. The objective of the project was to re-establish upstream passage to rearing habitat in Wallace Creek. The project entailed removal of a 42-inch CMP culvert under a county road (L Diamond Creek Road). The culvert was undersized and the outlet was perched, thus</p>	

Project Name: Wallace Creek Culvert Replacement

preventing upstream fish migration. The culvert was replaced with a 22-foot by 35-foot prefabricated modular steel bridge.

Design, Permitting, and Construction Issues:

The project was designed by Quadrant Consulting. LSWCD and OSC administered the funding provided by NOAA Fisheries Service. Project contracting and construction were administered by LSWCD. USBWP coordinated with landowners, regulatory agencies, and the County and completed environmental compliance/permitting for the project. Reclamation provided assistance to the USBWP by completing the cultural resource/SHPO clearance process for the project site.

Gallery:



Wallace Creek Culvert Replacement Project: culvert inlet before project, view from upstream.



Wallace Creek Culvert Replacement Project: Wallace Creek Bridge after project completion, view from upstream.

Wimpey Creek 2 Diversion Replacement Project

Project Name: Wimpey Creek 2 Diversion Replacement	
Project Type: Passage, Flow, Habitat	
Project Sponsor: Trout Unlimited	
Project Design: Reclamation	
Landowner(s): Private landowners	
Partners: Irrigators, BPA, Landowners, Trout Unlimited	Reclamation Development Costs: \$93,865
Funding Source(s): BPA	Implementation Cost: \$60,635.00
Project Location:	State: Idaho County: Lemhi Stream: Wimpey Creek Tributary, Lemhi River Latitude: 45° 05' 58.20" N Longitude: 113° 42' 54.98" W Local Landmark: Beside Skinner Ranch Drivewayl, off of Baker Road. Township: 21N Range: 23E Section: 34 ¼ Section:
Project Status: Completed	
Project Phase: Monitoring	
Milestones	Funding: Secured Design: Completed Permitting: Completed Construction Start Date: October 23, 2011 Construction Completion Date: November 17, 2011
Contracting	Advertised: August 2011
	Awarded: October 2011
Biological Benefit	Species: Chinook salmon, steelhead, bull trout
	Benefit Type: Fish passage
Metric: 0.5 miles made accessible	
Project Objectives and Description: Wimpey Creek is a tributary to the Lemhi River and discharges into the Lemhi River at the community of Baker, approximately 10 miles from Salmon, Idaho. The WC-2 diversion consisted of a wooden check structure that spanned the creek channel. Boards were placed in the structure by the irrigator to check the water surface up approximately 4 feet to direct flow into the irrigation ditch.	

Project Name: Wimpey Creek 2 Diversion Replacement

When in use, the diversion was a barrier to upstream migration and at times of low stream flow, virtually dewatered the stream channel below. A 3-cfs hydraulic modular rotary drum screen was installed in the ditch downstream of the point of diversion in 2007 by IDFG, but nothing was done to address fish passage issues associated with the diversion. In 2009, IDFG requested that Reclamation design a replacement diversion structure that would allow upstream fish migration. Reclamation and Trout Unlimited obtained funding from BPA and permission from the landowners and irrigators to replace the wooden check structure with a series of rock A Weirs and rehabilitate approximately 100 yards of stream channel and embankment severely degraded by cattle grazing. In addition to a new diversion and channel rehabilitation, additional project features included new headworks, ditch enlargement, riparian vegetation planting, water measurement device, and cattle water gap. Upon completion of the project fencing was erected to exclude cattle from access to the rehabilitated section of stream.

Design, Permitting, and Construction Issues:

Reclamation's River Systems Analysis Team completed a site assessment for the lower reach of Wimpey Creek prior to development of preliminary, draft and final design by Reclamation's Design Office. Throughout the design process, review was solicited and obtained from Federal, State, and local agencies and technical teams.

Reclamation coordinated with the landowners and irrigators to obtain access/permission to design/construct the project. Trout Unlimited obtained funding from BPA and developed habitat improvement and access agreements with landowners and irrigators. Some difficulty was experienced in developing agreements that were acceptable to all landowners/irrigators. Trout Unlimited served as project sponsor, administered funding/construction contracts, and managed construction.

Gallery:



Wimpey Creek 2 Diversion Replacement Project: original Wimpey Creek 2 wooden check structure before the project.



Wimpey Creek 2 Diversion Replacement Project: concrete slabs in stream channel below wood check structure.



Wimpey Creek 2 Diversion Replacement Project: completed channel rehabilitation, A-weir diversion, headworks.

PAHSIMEROI RIVER SUBBASIN

The Pahsimeroi River (HUC 17060202) is a tributary to the Salmon River, entering it at RM 304, and has a drainage area of about 825 square miles. In 2011, two projects were completed in this subbasin that improved access to juvenile rearing habitat.

ESA-listed fish species present in the river include SR spring/summer Chinook salmon (threatened), SR steelhead trout (threatened), SR sockeye salmon (endangered), and Columbia River bull trout (threatened).

Projects

- Hooper Lane Culvert Replacement Project
- Muddy Springs Creek Lower Culvert Replacement Project

Sponsors

- Custer Soil and Water Conservation District (CSWCD)

Partners

- Irrigators
- Bonneville Power Administration (BPA)
- Idaho Department of Fish and Game (IDFG)

Funding Sources

- BPA through the IDFG Screen Shop
- BPA through CSWCD

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Pahsimeroi River	\$196,825

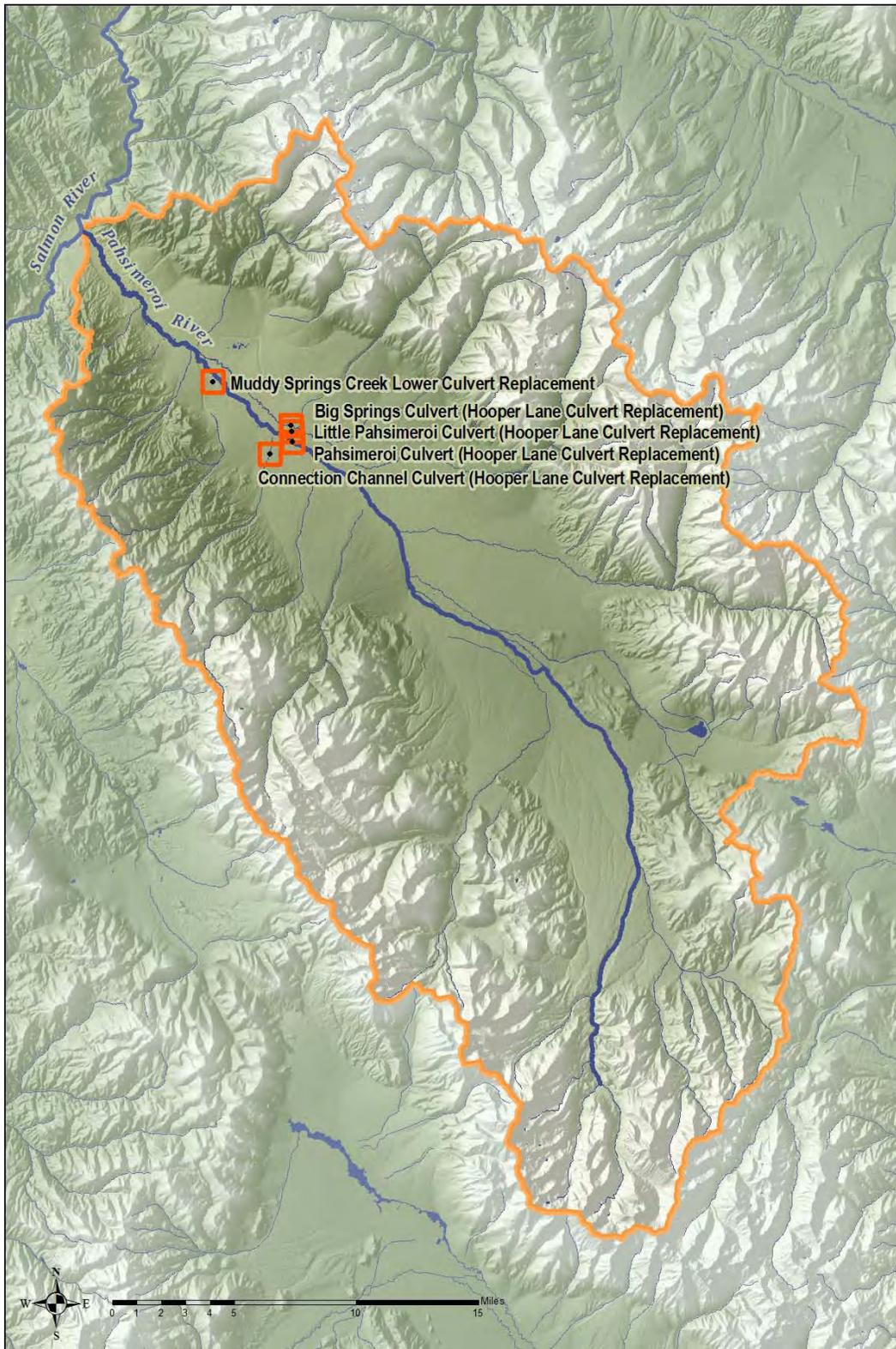


Figure 3. Location map of the projects completed in the Pahsimeroi River subbasin in 2011.

Hooper Lane Culvert Replacements Project

Project Name: Hooper Lane Culvert Replacements	
Project Type: Juvenile Barriers	
Project Sponsor: CSWCD	
Project Design: Reclamation	
Landowner(s): Private landowners	
Partners: BPA, IDFG, Irrigators	Reclamation Development Costs: \$199,114.55
Funding Source(s): BPA through IDFG Screen Shop	Implementation Cost: \$540,452.60
Project Location:	<p><i>State:</i> ID <i>County:</i> Lemhi <i>Stream:</i> Big Springs Creek</p> <p>Big Springs Culvert <i>Latitude:</i> 44° 33' 50.2" N <i>Longitude:</i> 113° 53' 46.3" W</p> <p>Little Pahsimeroi Culvert <i>Latitude:</i> 44° 33' 38.2" N <i>Longitude:</i> 113° 53' 46.2" W</p> <p>Pahsimeroi Culvert <i>Latitude:</i> 44° 33' 15.3" N <i>Longitude:</i> 113° 53' 46.0" W</p> <p>Connection Channel Culvert <i>Latitude:</i> 44° 33' 43.6" N <i>Longitude:</i> 113° 53' 46.3" W</p> <p><i>Local Landmark:</i> Hooper Lane crosses the Pahsimeroi Valley 2 miles south (upstream) of May, Idaho.</p>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: July 2011</p> <p>Construction Completion Date: September 2011</p>
Contracting	<p>Advertised: June 2011</p> <p>Awarded: June 2011</p>
Biological Benefit	<p>Species: Chinook salmon, steelhead</p> <p>Benefit Type: Improved access for juvenile rearing</p>

Project Name: Hooper Lane Culvert Replacements

Metric: Improved access to rearing habitat for juvenile fish and some potential spawning habitat, upstream of Hooper Lane.

- Big Springs Creek – 0.8 miles to BS 7/8 diversion, rebuilt in 2010. 4.5 miles including benefit of BS 7/8.
- Connection Channel – 0.5 miles
- Little Springs – 1.8 miles
- Pahsimeroi River – 4.5 miles

Project Objectives and Description:

Replaced culverts at four stream crossings on Hooper Lane with bridges. Hooper Lane is located roughly 2 miles upstream from May, Idaho in the Pahsimeroi River valley. All of the streams eventually run into the Pahsimeroi River, and then into the Salmon River. The four stream crossings were Big Springs Creek, Pahsimeroi River, Pahsimeroi Little Springs, and the Big Springs/Little Springs Connection Channel. Steel beam bridges were installed at all four locations.

Big Springs Creek Bridge – Improved access in Big Springs Creek for 0.8 miles, up to BS 7/8 diversion. BS 7/8 diversion was rebuilt in 2010, with no metric improvements claimed since it was upstream of the Hooper Lane culvert barrier, so access to the 3.7 miles of Big Springs Creek between BS 7/8 and the BS 9 diversions (4.5 total miles) was also improved.

Pahsimeroi River Bridge – Improved access to 4.5 miles of the Pahsimeroi River channel, up to the P-15 diversion. This stretch of the river sometimes goes dry, and future projects are scheduled to provide additional water which would improve the value of the better access provided by the new bridge.

Pahsimeroi Little Springs – Improved access to the upper 1.8 miles of this spring-fed channel.

Big Springs/Little Springs Connection Channel – Improved access for 0.3 miles of a spring channel tributary to this channel, plus 0.2 miles of the Connection Channel up to the diversion from Big Springs Creek, plus the distance from the diversion point upstream to BS 9 diversion. Since the distance up to BS 9 was included under the Big Springs Creek Bridge, the improved access here could be tallied at 0.5 miles.

Total benefits for the Hooper Lane Culvert Replacements would include improved access to 11.3 miles of stream channel, mainly for juvenile rearing, but some potential spawning habitat as well.

Design, Permitting, and Construction Issues:

Reclamation designed these structures. IDFG provided fish salvage and hydro-seeding. CSWCD coordinated with landowners and provided all environmental clearances and construction permits. Reclamation provided construction oversight.

Gallery:



Hooper Lane Culvert Replacements Project: Big Springs Creek before project; the old culverts were a barrier to juvenile fish movement.



Hooper Lane Culvert Replacements Project: Big Springs Creek Bridge after project completion provides improved juvenile access upstream of Hooper Lane.



Hooper Lane Culvert Replacements Project: Connection Channel before project; the old culvert was undersized and restricted juvenile fish passage.



Hooper Lane Culvert Replacements Project: Connection Channel Bridge after project completion provides improved juvenile access upstream of Hooper Lane.



Hooper Lane Culvert Replacements Project: Little Springs Creek before project; the old culvert restricted juvenile access.



Hooper Lane Culvert Replacements Project: Little Springs Bridge after project completion provides unrestricted juvenile access.



Hooper Lane Culvert Replacements Project: old culvert at Pahsimeroi River restricted juvenile access at high flows.



Hooper Lane Culvert Replacements Project: new Pahsimeroi River bridge after project completion provides unrestricted juvenile access.

Muddy Springs Creek Lower Culvert Replacement Project

Project Name: Muddy Springs Creek Lower Culvert Replacement	
Project Type: Juvenile Barrier	
Project Sponsor: CSWCD	
Project Design: Reclamation	
Landowner(s): Private landowner	
Partners: BPA, IDFG, Irrigators	Reclamation Development Costs: \$23,441.53
Funding Source(s): BPA through CSWCD	Implementation Cost: \$20,000
Project Location:	<p>State: Idaho County: Lemhi</p> <p>Stream: Muddy Springs Creek</p> <p>Latitude: 44° 35' 41.3" N Longitude: 113° 57' 22.8" W</p> <p>Local Landmark: Culvert is located 0.6 miles upstream from confluence with Pahsimeroi River on a farm road.</p>
Project Status: Completed	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: August 2011</p> <p>Construction Completion Date: August 2011</p>
Contracting	Advertised: June 2010
	Awarded: August 2010
Biological Benefit	Species: Chinook salmon, steelhead
	Benefit Type: Improved access for juvenile rearing
Metric: Improved access to rearing habitat for juvenile fish in Muddy Springs Creek. Steelhead	

Project Name: Muddy Springs Creek Lower Culvert Replacement

and salmon have not been documented spawning within Muddy Springs Creek, so access for juvenile rearing will have to come upstream from the Pahsimeroi River. Removal of the culvert improved access to juvenile rearing for 1.5 miles, up to the Upper Muddy Springs Culvert, which was replaced in 2010. The upper culvert replacement project will allow access at least 1.3 miles farther upstream, to the next road crossing, where passage conditions are unknown at this time.

Project Objectives and Description:

Removed a 4-foot-diameter culvert on Muddy Springs Creek, 0.6 miles from the intersection with the Pahsimeroi River, and replaced it with a bottomless arch pipe 12 feet across. Larger cross section with the bottomless arch pipe will decrease velocity and improve fish passage at the site. There is a similar culvert located 2.1 miles up from the intersection with the Pahsimeroi River (1.5 miles upstream) that was replaced in 2010. Combined, the two culvert replacements provide improved juvenile access to at least 2.8 miles, and possibly as much as 5.5 miles of Muddy Springs Creek upstream of the lower culvert (there are other road crossings upstream where fish passage conditions are unknown at this time).

Design, Permitting, and Construction Issues:

Reclamation designed the structure. IDFG provided input into the type of design needed and wanted. IDFG coordinated with landowners and provided all environmental clearances and construction permits. Reclamation provided construction oversight.

Gallery:



Muddy Springs Lower Culvert Replacement Project: the old 4-foot-diameter culvert restricted access for juvenile fish movement before the project.



Muddy Springs Creek Lower Culvert Replacement Project: the new 12-foot wide bottomless arch pipe provides access upstream for juvenile fish.

UPPER SALMON RIVER SUBBASIN

The Upper Salmon River subbasin (HUC 17060201) extends from its headwaters in the Sawtooth Mountains to its confluence with the Middle Fork Salmon River, excluding the Lemhi and Pahsimeroi River subbasins. The subbasin has a drainage area of approximately 2,425 square miles. The Upper Salmon River subbasin includes the East Fork and Yankee Fork drainages, the latter of which is being studied for future projects. In 2011, one project was completed in the subbasin that removed a fish migration barrier.

ESA-listed fish species present in the river include Snake River (SR) spring/summer Chinook salmon (threatened) SR steelhead trout (threatened), SR sockeye salmon (endangered), and Columbia River bull trout (threatened).

Projects

- Bayhorse Creek Diversion Removal

Sponsors

- Custer Soil and Water Conservation District (CSWCD)

Partners

- Landowner/Irrigators
- Bonneville Power Administration (BPA)
- Natural Resources Conservation Service (NRCS)
- Idaho Department of Fish and Game (IDFG)

Funding Sources

- BPA through CSWCD

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Upper Salmon River	\$633,995

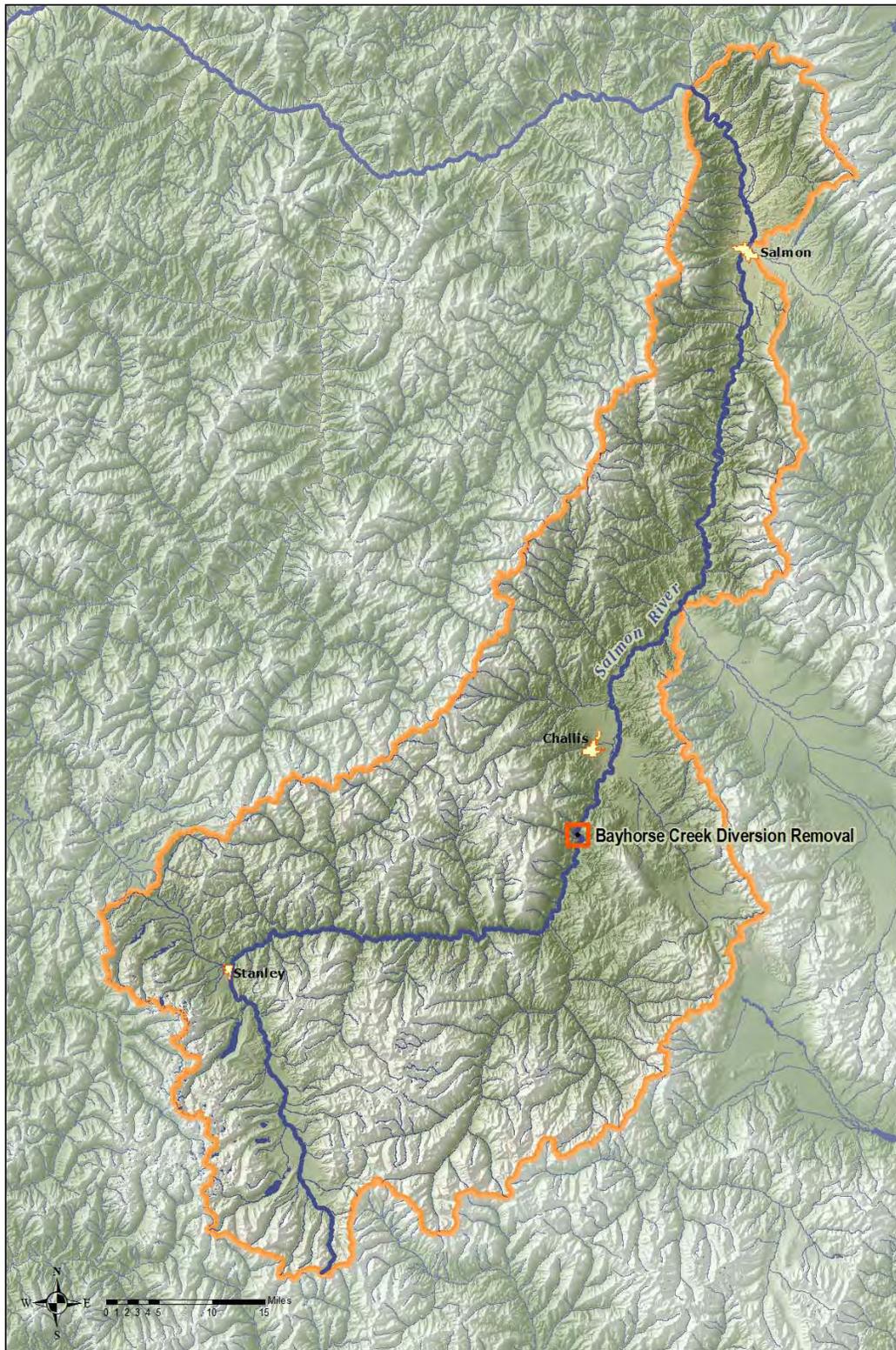


Figure 4. Location map of the project completed in the Upper Salmon River subbasin in 2011.

Bayhorse Creek Diversion Removal Project

Project Name: Bayhorse Creek Diversion Removal	
Project Type: Juvenile Barrier, Flow	
Project Sponsor: CSWCD	
Project Design: NRCS and IDFG	
Landowner(s): Private landowner	
Partners: BPA, NRCS, IDFG, Irrigators	Reclamation Development Costs: \$20,258.932
Funding Source(s): BPA through CSWCD	Implementation Cost:
Project Location:	<p>State: Idaho County: Custer Stream: Bayhorse Creek</p> <p>BaC-2 Diversion Latitude: 44° 22' 48.5" N Longitude: 114° 15' 38.3" W</p> <p>New Well Location Latitude: 44° 23' 11.4" N Longitude: 114° 15' 51.3" W</p> <p>Local Landmark: Bayhorse Creek flows into the Salmon River approximately 10 miles upstream of Challis, Idaho.</p>
Project Status: Completed	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: May 2011</p> <p>Construction Completion Date: October 2011</p>
Contracting	<p>Advertised: January 2011</p> <p>Awarded: March 2011</p>
Biological Benefit	<p>Species: Chinook salmon, steelhead</p> <p>Benefit Type: Improved access for juvenile rearing, increased instream flow</p>
Metric: Improved access to 0.5 miles of rearing habitat for juvenile fish by eliminating the BaC-2 diversion. Also increased flow in Bayhorse Creek by eliminating the 2.0 cfs diversion at BaC-2, and replacing with groundwater diversion of 0.3 cfs.	
Project Objectives and Description:	
Eliminate the BaC-2 diversion of approximately 2 cfs and leave the flow in Bayhorse Creek. Fields watered by flood irrigation were converted over to a center pivot irrigation system. A well was drilled to provide 0.3 cfs irrigation water. Bayhorse Creek provides cold water habitat off the warmer Salmon River during the summer months.	

Project Name: Bayhorse Creek Diversion Removal

Design, Permitting, and Construction Issues:

IDFG Anadromous Screen Shop coordinated the project with the landowner. NRCS designed the irrigation system. Reclamation and CSWCD coordinated on a test well to determine whether groundwater was available for pumping.

Gallery:



Bayhorse Creek Diversion Removal Photograph: the new well and center pivot irrigation system that was installed to replace the flood irrigation provided by the BaC-2 diversion.

JOHN DAY RIVER BASIN

The John Day River is a tributary to the Columbia River at RM 204, entering about 13 miles upstream from the U.S. Army Corps of Engineers' John Day Dam. Within the John Day River watershed (HUC 17060209), Reclamation works in three subbasins: the Upper John Day, the North Fork John Day, and the Middle Fork John Day. In 2011, one project was completed in the Middle Fork John Day River subbasin and nine projects were completed in the Upper John Day River subbasin.

Anadromous species present in the river include Middle Columbia River (MCR) steelhead trout (ESA-listed as threatened) and MCR spring-run Chinook salmon (not ESA-listed). Pacific lamprey are also present.

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Upper John Day River	\$430,969
Middle Fork John Day River	\$544,606
Total	\$975,575

MIDDLE FORK JOHN DAY RIVER SUBBASIN

The Middle Fork John Day River (HUC 17070203) is a tributary to the North Fork John Day River, entering it at RM 32, and has a drainage area of about 785 square miles. In 2011, one project was completed in this subbasin that added pools, cover, and complex habitat for fish.

Anadromous species present in the river include Middle Columbia River (MCR) steelhead trout (ESA-listed as threatened) and MCR spring-run Chinook salmon (not ESA-listed). Lamprey are also present.

Project

- Oxbow Conservation Area Dredge Tailings Restoration Project, Phase I

Sponsors

- Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO)

Partners

- CTWSRO
- U.S. Fish and Wildlife (USFWS)
- Bonneville Power Administration (BPA)
- Oregon Watershed Enhancement Board (OWEB)

Funding Sources

- BPA
- OWEB
- EcoTrust
- USFWS

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Middle Fork John Day River	\$544,606

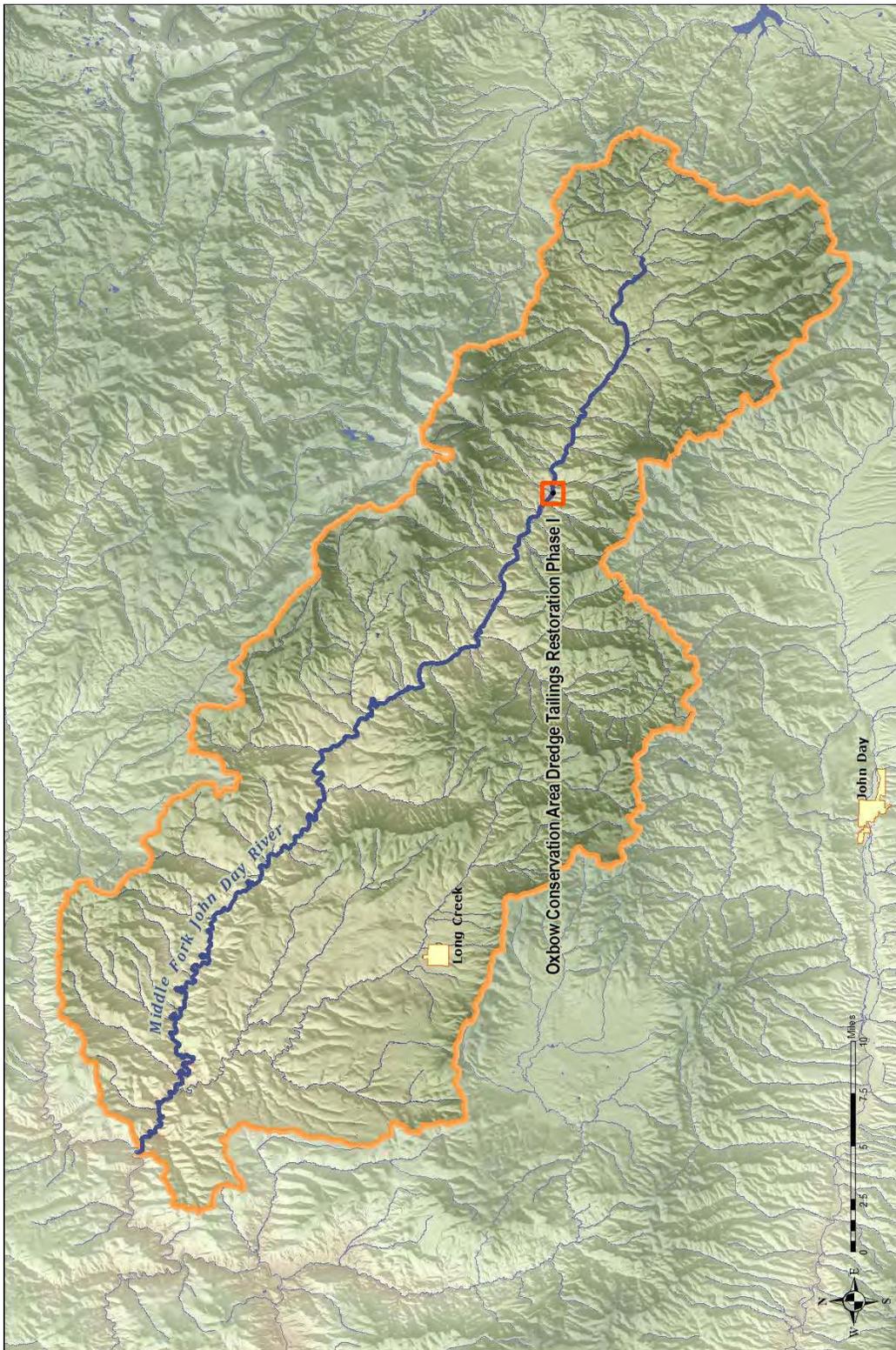


Figure 5. Location map of the project completed in the Middle Fork John Day River subbasin in 2011.

Oxbow Conservation Area Dredge Tailings Restoration Project, Phase I

Project Name: Oxbow Conservation Area Dredge Tailings Restoration Phase I	
Project Type: Channel Complexity	
Project Sponsor: CTWSRO	
Project Design: Forest Service Enterprise Team funded by Reclamation	
Landowner(s): CTWSRO	
Partners: USFWS, CTWSRO, BPA, OWEB	Reclamation Development Costs: \$150,000
Funding Source(s): BPA, OWEB, EcoTrust, USFWS	Implementation Cost: \$230,000
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Middle Fork John Day River <i>Latitude:</i> 44° 38' 32.69" N <i>Longitude:</i> 118° 39' 35.20" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Completed (Phase I)	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> steelhead, Chinook salmon, bull trout
	<i>Benefit Type:</i> Add pool, cover, and complex habitat
Metric: 1.1 miles (Phase I Only)	
Project Objectives and Description: <p>The Oxbow Conservation area is owned and managed by CTWSRO. The property was historically a cattle ranch with many decades of land clearing and cattle grazing. In the early 1940s, much of the property was dredge mined for gold, leaving much of the river valley highly disturbed. The</p>	

Project Name: Oxbow Conservation Area Dredge Tailings Restoration Phase I

dredging operation left a bifurcated stream channel where 1.1 miles of natural channel was left intact referred to as the South Channel and 1.6 miles of channelized channel referred to as the North Channel. The North Channel has very little salmonid rearing habitat while the South Channel suffers from depleted flows, high water temperatures, and low gravel recruitment from lack of tributary input. The project to rehabilitate the dredge tailing section of the valley is being undertaken in three phases.

Phase 1 was to prepare the South Channel for the additional flow when the North Channel is blocked off in Phase II. Phase I construction consisted of constructing 32 log structures from approximately 400 logs for habitat complexity and floodplain improvement, salvaging and placing approximately 200 Torrent Sedge clumps from the North Channel, planting hundreds of willow cuttings, and removing one small area of dredge tailings from the floodplain.

Phase II will block and fill the North Channel at the bifurcation and construct a new channel for Granite Boulder Creek across the floodplain to connect to the South Channel. It will also reshape or remove a large area of dredge tailings that is currently reducing the active floodplain area for the South Channel and Granite Boulder Creek.

Phase III will construct a new channel for the River from the end of the natural part of the South Channel down to the confluence of Beaver Creek, a distance of approximately 1.2 miles.

Design, Permitting, and Construction Issues:

Planning of the project was started by Reclamation, then an interagency agreement was formed with the Forest Service Enterprise Team who completed the design work for Phase I. Phase I was consulted on through the USFWS Partners in Wildlife Programmatic Biological Opinion. Cultural resources survey and consultation compliance was partially completed by Reclamation on behalf of BPA who, as the lead federal agency, consulted with SHPO.

Gallery:



Oxbow Conservation Area Dredge Tailings Restoration Phase I Project: log structure in Phase I.



Oxbow Conservation Area Dredge Tailings Restoration Phase I Project: view showing log jam in foreground and channel spanning logs further downstream.



Oxbow Conservation Area Dredge Tailings Restoration Phase I Project: view showing floodplain wood placement.

UPPER JOHN DAY RIVER SUBBASIN

The Upper John Day River (HUC 17070201) becomes the mainstem John Day River after it is joined by the Middle Fork and South Fork John Day rivers. The Upper John Day River has a drainage area of about 2,130 square miles. In 2011, nine projects were completed in the subbasin that removed barriers, improved fish passage, improved main channel function, and added pools, cover, and complex fish habitat.

Anadromous species present in the river include Middle Columbia River (MCR) steelhead trout (ESA-listed as threatened) and MCR spring-run Chinook salmon (not ESA-listed). Pacific lamprey are also present.

Projects

- Dads Creek Winegar Diversion Project
- Dads Creek #3 CTWSRO Diversion Project
- Dads Creek Diversions #4 and #5 Project
- East Fork Canyon Creek Diversion Project
- Edigar Habitat Improvement Project
- Mark Lawrence Reynolds Creek Diversion Project
- Lower Deardorff Creek Diversion Project
- Reynolds Slough Ditch Diversion Project
- Upper Deardorff Creek Diversion Project

Sponsors

- Grant Soil and Water Conservation District (GSWCD)

Partners

- Private Landowners
- GSWCD
- CTWSRO
- OWEB

- Bonneville Power Administration
- Oregon Department of Fish and Wildlife (ODFW)

Funding Sources

- BPA through CTWSRO Restoration Program
- OWEB
- ODFW

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Upper John Day River	\$430,969



Figure 6. Location map of the projects completed in the Upper John Day River subbasin in 2011.

Dads Creek #2 Winegar Diversion Project

Project Name: Dads Creek #2 Winegar Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): CTWSRO; responsible for irrigating land owned by private owner	
Partners: GSWCD, Landowner, CTWSRO, OWEB	Reclamation Development Costs: \$12,500
Funding Source(s): BPA through the CTWSRO Restoration Program, OWEB	Implementation Cost: \$9,100
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Dads Creek
	<i>Latitude:</i> 44° 27' 44" N <i>Longitude:</i> 118° 39' 57" W
	<i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	Funding: Secured
	Design: Completed
	Permitting: Completed
	Construction Start Date: July 15, 2011
	Construction Completion Date: August 15, 2011
Contracting	Advertised: N/A
	Awarded: N/A
Biological Benefit	Species: steelhead, Chinook salmon
	Benefit Type: Passage, Barrier
Metric: 0.1 miles	
Project Objectives and Description:	
<p>This project is one of multiple projects initiated by CTWSRO to improve the Dads Creek watershed. This diversion is the first diversion of four that will be replaced, opening access to the rest of the watershed. The existing diversion consisted of boulders boards and tarps and was a complete barrier when it was installed. The diversion rate for this diversion is 0.28 cfs.</p>	

Project Name: Dads Creek #2 Winegar Diversion

The GSWCD designed and installed a modified lay-flat stanchion dam prefabricated out of steel and set it in place. Fish passage is provided by a prefabricated weir and pool fishway to side of the structure.

Design, Permitting, and Construction Issues:

Due to the size and location similarities, designs for the other three diversions on Dads Creek were near duplications which reduced design and implementation costs.

Gallery:



Dads Creek #2 Winegar Diversion Project: existing Dads Creek #2 diversion during dry channel conditions.



Dads Creek #2 Winegar Diversion Project: completed diversion at low flow.



Dads Creek #2 Winegar Diversion Project: view of fish passage.

Dads Creek #3 CTWSRO Diversion Project

Project Name: Dads Creek #3 CTWSRO Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): CTWSRO; responsible for irrigating land owned by the Tribe and private landowner	
Partners: GSWCD, Landowner, CTWSRO, OWEB	Reclamation Development Costs: \$12,200
Funding Source(s): BPA through the CTWSRO Restoration Program, OWEB	Implementation Cost: \$8,700
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Dads Creek <i>Latitude:</i> 44° 27' 50" N <i>Longitude:</i> 118° 39' 55" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> steelhead, Chinook salmon
	<i>Benefit Type:</i> Passage barrier
Metric: 1.0 miles	
Project Objectives and Description: This project is one of multiple projects initiated by CTWSRO to improve the Dads Creek watershed. This diversion is the second diversion of four that will be replaced, opening access to the rest of the watershed. The diversion consisted of boulders boards and tarps and was a complete barrier when installed. The diversion rate for this diversion is 0.77 cfs.	

Project Name: Dads Creek #3 CTWSRO Diversion

GSWCD designed and installed a modified lay-flat stanchion dam prefabricated out of steel and set it in place. Fish passage is provided by a prefabricated weir and pool fishway to side of the structure.

Design, Permitting, and Construction Issues:

Due to the size and location similarities designs for the other three diversions on Dads Creek were near duplications which reduced design and implementation costs.

Gallery:



Dads Creek #3 CTWSRO Diversion Project: diversion before project.



Dads Creek #3 CTWSRO Diversion Project: diversion at low flow after project completion.

Dads Creek Diversions #4 and #5 Project

Project Name: Dads Creek Diversions #4 and #5	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): CTWSRO; responsible for irrigating land owned by private landowner	
Partners: GSWCD, Landowner, CTWSRO, OWEB	Reclamation Development Costs: \$17,300
Funding Source(s): GSWCD, BPA through the CTWSRO Restoration Program	Implementation Cost: \$25,000
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Dads Creek <i>Latitude:</i> 44° 28' 35.15" N <i>Longitude:</i> 118° 39' 33.07" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Completed	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> steelhead
	<i>Benefit Type:</i> Passage barrier
Metric: 3.4 miles	
Project Objectives and Description:	
<p>Dads Creek Diversions #4 and #5 are about 3 miles northeast of Prairie City, Oregon. These two diversions are on the CTWSRO Forrest Conservation Area, but deliver water to a different landowner. Replacing these two diversion dams is part of a large scale effort to improve access and stream flows in Dads Creek. Dads Creek maintains a remnant population of steelhead with the potential to expand considerably with improved access and watershed condition. Both diversions consisted of tarps and debris and did not have headgates. The water rights for these two diversions</p>	

Project Name: Dads Creek Diversions #4 and #5

indicated that a total of 1.04 cfs can be diverted from either of the locations.

GSWCD designed and installed a modified lay-flat stanchion dam prefabricated out of steel and set in place. Fish passage is provided by a prefabricated weir and pool fishway to the side of the structure.

Design, Permitting, and Construction Issues:

Due to the size and location similarities designs for the other three diversions on Dads Creek were near duplications which reduced design and implementation costs.

Gallery:



Dads Creek Diversions #4 and #5 Project: site of Dads #4 diversion before project. Channel was dry and the diversion was not installed at time of the site visit.



Dads Creek Diversions #4 and #5 Project: Dads Creek #5 diversion location with remnants of the dam before the project.



Dads Creek Diversions #4 and #5 Project: Completed Dads Creek diversion #4 at low flow and check board removed.



Dads Creek Diversions #4 and #5 Project: completed Dads Creek diversion #5 with check board removed.

East Fork Canyon Creek Diversion Project

Project Name: East Fork Canyon Creek Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): Private landowner	
Partners: GSWCD, Landowner, CTWSRO, BPA, OWEB	Reclamation Development Costs: \$17,500
Funding Source(s): BPA through the CTWSRO Restoration Program, OWEB	Implementation Cost: \$27,230
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> East Fork Canyon Creek <i>Latitude:</i> 44° 14' 47" N <i>Longitude:</i> 118° 54' 47" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> steelhead, Chinook salmon
	<i>Benefit Type:</i> Barrier
Metric: 1.3 miles	
Project Objectives and Description: This diversion is one of two diversions on the East Fork of Canyon Creek. The instream part of the structure was composed of large cobble and tarps. No headgate was present so flow control was managed by blocking the creek with tarps. This diversion was a full barrier at lower flows and dependent on year-to-year construction of the dam. Preliminary review of the water rights indicates this diversion has a water right for diversion of 0.74 cfs.	

Project Name: East Fork Canyon Creek Diversion

GSWCD designed and installed a lay-flat stanchion dam with a prefabricated steel weir and pool fish passage structure on one side and slide headgate to control diversion flow.

Design, Permitting, and Construction Issues:

Gallery:



East Fork Canyon Creek Diversion Project: lower East Fork Canyon Creek Diversion site before the project. Dam not installed at time of site visit.



East Fork Canyon Creek Diversion Project: completed Lower East Fork Canyon Creek Diversion Project structure with fish passage on left.

Edigar Habitat Improvement Project

Project Name: Edigar Habitat Improvement Project	
Project Type: Channel Complexity	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): Private landowner	
Partners: GSWCD, Landowner, ODFW	Reclamation Development Costs: \$18,100
Funding Source(s): ODFW	Implementation Cost: \$18,200
Project Location:	State: Oregon County: Grant Stream: Upper John Day River Latitude: 44° 25' 10.5" N Longitude: 119° 11' 2.9" W Township: Range: Section: ¼ Section:
Project Status: Complete	
Project Phase: Monitoring	
Milestones	Funding: Secure Design: Complete Permitting: Complete Construction Start Date: July 15, 2011 Construction Completion Date: August 30, 2011
Contracting	Advertised: N/A
	Awarded: N/A
Biological Benefit	Species: steelhead, Chinook salmon, bulltrout
	Benefit Type: Improve main channel function and add pool, cover, and complex habitat
Metric: 0.057 miles	
Project Objectives and Description: <p>The Edigar property is 3 miles west of Mt. Vernon, Oregon on the Upper John Day River. The property has one section of river bank about 300 feet long that was actively eroding, causing losses in bank vegetation and water quality issues downstream.</p>	

Project Name: Edigar Habitat Improvement Project

GSWCD designed and installed log jam/rootwad structures to reduce bank erosion and add pool, cover, and complexity habitat.

Design, Permitting, and Construction Issues:

Gallery:



Edigar Habitat Improvement Project: completed log/rootwad structures.

Mark Lawrence Reynolds Creek Diversion Project

Project Name: Mark Lawrence Reynolds Creek Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): Private landowner	
Partners: GSWCD, Landowner, CTWSRO, BPA, OWEB	Reclamation Development Costs: \$18,000
Funding Source(s): BPA through the CTWSRO Restoration Program, OWEB	Implementation Cost: \$32,200
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> John Day River <i>Latitude:</i> 44° 24' 51" N <i>Longitude:</i> 118° 35' 15" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> steelhead, Chinook salmon, bulltrout
	<i>Benefit Type:</i> Increased fish passage
Metric: 0.5 miles	
Project Objectives and Description: The Mark Lawrence Reynolds Creek Diversion is located about 6.5 miles southeast of Prairie City, Oregon. Reynolds Creek is near the headwaters of the Upper John Day River and has strong cool base flows during late summer and supports spawning and rearing of steelhead, bulltrout, and Chinook salmon. The diversion consisted of a failing concrete sill and wing walls with slots to support boards. With boards and tarps in place, there was no provision for fish passage and no	

Project Name: Mark Lawrence Reynolds Creek Diversion

headgate.

GSWCD designed and installed a lay-flat stanchion dam with a prefabricated steel weir and pool fish passage structure on one side and a slide headgate to control diversion flow.

Design, Permitting, and Construction Issues:

Gallery:



Mark Lawrence Reynolds Creek Diversion Project: Lawrence Diversion with old concrete sill and side walls.



Mark Lawrence Reynolds Creek Diversion Project: nearly complete diversion structure.

Lower Deardorff Creek Diversion Project

Project Name: Lower Deardorff Creek Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): private landowners	
Partners: GSWCD, Landowner, CTWSRO, BPA, ODFW, OWEB	Reclamation Development Costs: \$18,500
Funding Source(s): BPA through the CTWSRO Restoration Program, ODFW	Implementation Cost: \$34,815
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Deardorff Creek <i>Latitude:</i> 44° 23' 47" N <i>Longitude:</i> 118° 33' 44" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> bull trout, Chinook salmon, ESA-listed summer steelhead
	<i>Benefit Type:</i> Barrier
Metric: 0.1 miles	
Project Objectives and Description: This diversion is one of two known diversions on Deardorff Creek. The instream part of the structure was composed of large cobble, gravel, and tarps. No headgate was present so flow control was managed by blocking the ditch with tarps. This diversion was a full barrier at lower flows and dependent on year-to-year construction of the dam. Review of the water rights indicated this diversion has a water right for a diversion of 3.64 cfs.	

Project Name: Lower Deardorff Creek Diversion

GSWCD designed and installed a lay-flat stanchion dam with a prefabricated steel weir and pool fish passage structure on one side and slide headgate to control diversion flow.

Design, Permitting, and Construction Issues:

Project construction was delayed by a year because of the NOAA Fisheries Service consultation process. A new consultation was initiated in 2010 and a biological opinion was received for 2011 construction.

Gallery:



Lower Deardorff Creek Diversion Project: lower Deardorff diversion prior to construction.



Lower Deardorff Creek Diversion Project: completed Lower Deardorff diversion

Upper Deardorff Creek Diversion Project

Project Name: Upper Deardorff Creek Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): Private landowners	
Partners: GSWCD, Landowner, CTWSRO, BPA, ODFW, OWEB	Reclamation Development Costs: \$20,571
Funding Source(s): BPA through the CTWSRO Restoration Program, ODFW	Implementation Cost: \$38,393
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Deardorff Creek <i>Latitude:</i> 44° 23' 48" N <i>Longitude:</i> 118° 33' 43" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> bulltrout, Chinook salmon, listed summer steelhead
	<i>Benefit Type:</i> Barrier
Metric: 6.5 miles	
Project Objectives and Description: This diversion is one of two known diversions on Deardorff Creek. The instream part of the structure was composed of large cobble, gravel, and tarps. No headgate was present so flow control was managed by blocking the ditch with tarps. This diversion was a full barrier at low flows and dependent on year-to-year construction of the dam. Preliminary review of the water rights indicate	

Project Name: Upper Deardorff Creek Diversion

this diversion has a water right for a diversion of 1.67 cfs.

GSWCD designed and installed a lay-flat stanchion dam with a prefabricated steel weir and pool fish passage structure on one side and a slide headgate to control the diversion flow.

Design, Permitting, and Construction Issues:

Project construction was delayed by a year because of the NOAA Fisheries Service consultation process. A new consultation was initiated in 2010 and a biological opinion was received for 2011 construction.

Gallery:



Upper Deardorff Creek Diversion Project: view of the diversion dam before project.



Upper Deardorff Creek Diversion Project: completed Upper Deardorff Diversion after completion.

Reynolds Slough Ditch Diversion Project

Project Name: Reynolds Slough Ditch Diversion	
Project Type: Barrier	
Project Sponsor: GSWCD	
Project Design: GSWCD	
Landowner(s): Private landowners	
Partners: Landowner, GSWCD, CTWSRO, BPA, OWEB	Reclamation Development Costs: \$18,000
Funding Source(s): BPA through the CTWSRO Restoration Program, OWEB	Implementation Cost: \$27,900
Project Location:	<i>State:</i> Oregon <i>County:</i> Grant <i>Stream:</i> Reynolds Creek <i>Latitude:</i> 44° 24' 40.3" N <i>Longitude:</i> 118° 34' 40.4" W <i>Township:</i> <i>Range:</i> <i>Section:</i> <i>¼ Section:</i>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> July 15, 2011 <i>Construction Completion Date:</i> August 15, 2011
Contracting	<i>Advertised:</i> N/A
	<i>Awarded:</i> N/A
Biological Benefit	<i>Species:</i> steelhead, Chinook salmon, bulltrout
	<i>Benefit Type:</i> Increased fish passage
Metric: 13.8 miles	
Project Objectives and Description: The Reynolds Slough Ditch Diversion is about 7 miles southeast of Prairie City, Oregon. This diversion is one of two diversions remaining to be treated on Reynolds Creek. The diversion consisted of river cobble and gravel and had a partially functioning headgate. Review of the water rights indicated this diversion has a water right for a diversion of 1.12 cfs.	

Project Name: Reynolds Slough Ditch Diversion

The Grant SWCD designed and installed a lay-flat stanchion dam with a prefabricated steel weir and pool fish passage structure on one side and slide headgate to control diversion flow.

Design, Permitting, and Construction Issues:

Gallery:



Reynolds Slough Ditch Diversion Project: dam was only partially installed at time of site visit.



Reynolds Slough Ditch Diversion Project: completed project.

UPPER COLUMBIA RIVER BASIN

The Upper Columbia River (UCR) Basin, generally described as the Columbia River upstream from Grand Coulee Dam in Washington, has a drainage area of about 74,100 square miles, including approximately 39,000 square miles that extend into Canada. Reclamation works in three Upper Columbia River subbasins in the United States: the Entiat, the Methow, and the Wenatchee. In 2011, three projects were completed in the Entiat River subbasin, one in the Methow River subbasin, and one in the Wenatchee River subbasin.

ESA-listed anadromous fish species present in this part of the Basin include UCR spring-run Chinook salmon (endangered) and UCR steelhead trout (threatened). Also present are UCR summer/fall-run Chinook salmon (not listed). The Yakama Nation has a Coho salmon reintroduction program in the Wenatchee River subbasin.

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Entiat River	\$1,310,586
Methow River	\$2,058,294
Wenatchee River	\$1,337,344
Total	\$4,706,224

ENTIAT RIVER SUBBASIN

The Entiat River is tributary to the Columbia River at RM 483.7. The Entiat subbasin (HUC 17020010, officially the Upper Columbia-Entiat subbasin) has an area of about 1,520 square miles. In 2011, three projects were completed in the subbasin that reduced entrainment mortality for juvenile fish, prevented fine sediment loading to spawning gravels, and provided habitat cover, riparian shading, and complexity.

ESA-listed anadromous species include UCR spring Chinook salmon (endangered) and UCR steelhead trout.

Projects

- ARRA Wells Project
- Ecology Wells Project
- Preston Reach Project

Sponsors

- Cascadia Conservation District (CCD)

Partners

- Washington Department of Ecology (WDOE)
- Trout Unlimited
- U.S. Fish and Wildlife (USFWS)
- Chelan Douglas Land Trust (CDLT)

Funding Sources

- Reclamation through the ARRA program
- WDOE

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Entiat River	\$1,310,586



Figure 7. Location map of the projects completed in the Entiat River subbasin in 2011.

ARRA Wells Project

Project Name: ARRA Wells	
Project Type: Conversion of surface water irrigation diversions to wells	
Project Sponsor: CCD	
Project Design: Reclamation (geology, well screens, pump test analysis)	
Landowner(s): private landowners	
Partners: WDOE, Trout Unlimited	Reclamation Development Costs:
Funding Source(s): USBR, ARRA	Implementation Cost: \$394,613.20
Project Location:	<p><i>State:</i> WA <i>County:</i> Chelan <i>Stream:</i> Entiat River</p> <p>Site 1: <i>Latitude:</i> 47° 41' 15.72" N <i>Longitude:</i> 120° 18' 54.72" W</p> <p>Site 2: <i>Latitude:</i> 47° 41' 29.4" N <i>Longitude:</i> 120° 19' 0.48" W <i>Local Landmark:</i> About 0.5 mile downstream of USFWS Entiat National Fish Hatchery</p> <p><i>Township:</i> 25N <i>Range:</i> 20E <i>Section:</i> 3 <i>¼ Section:</i> SW and SE</p>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: December 10, 2010</p> <p>Construction Completion Date: September 30, 2011</p>
Contracting	Advertised: Various dates (multiple contracts)
	Awarded: Various dates
Biological Benefit	Species: Upper Columbia spring Chinook, steelhead
	Benefit Type: Reduction of entrainment mortality for juvenile ESA species
Metric: 2.4 cfs; 38 stream miles affected	

Project Name: ARRA Wells

Project Objectives and Description:

The objective was to reduce pump entrainment risk to juvenile ESA fish species in the lower Entiat River by converting two existing surface water irrigation diversions to wells. This was accomplished by drilling a total of five irrigation wells to serve two orchards and plumbing them to existing water distribution systems.

Design, Permitting, and Construction Issues:

Gallery:



ARRA Wells Project: well drilling at Site No. 2.



ARRA Wells Project: finished well at Site No. 1.



ARRA Wells Project: connecting the new wells to the existing distribution system at at Site No. 1.



ARRA Wells Project: running connection pipe to existing system at at Site No. 1.

Ecology Wells Project

Project Name: Ecology Wells	
Project Type: Conversion of surface water irrigation diversions to wells	
Project Sponsor: CCD	
Project Design: Reclamation (geology, well screens, pump test analysis)	
Landowner(s): Private landowners	
Partners: CCD, Trout Unlimited	Reclamation Development Costs: \$25,000
Funding Source(s): WDOE	Implementation Cost: about \$175,000
Project Location:	<p><i>State:</i> WA <i>County:</i> Chelan <i>Stream:</i> Entiat River</p> <p><i>Latitude:</i> 47° 41' 12.84" N <i>Longitude:</i> 120° 18' 56.16" W</p> <p><i>Latitude:</i> 47° 41' 31.92" N <i>Longitude:</i> 120° 19' 1.2" W</p> <p><i>Latitude:</i> 47° 39' 56.51" N <i>Longitude:</i> 120° 15' 58.68" W</p> <p><i>Township:</i> 25N <i>Range:</i> 20E <i>Section:</i> 3,13</p> <p><i>¼ Section:</i> SW (Sec.3) and NE (Sec. 13)</p>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: June 8, 2011</p> <p>Construction Completion Date: November 8, 2011</p>
Contracting	Advertised: May 10, 2011
	Awarded: May 31, 2011
Biological Benefit	Species: Upper Columbia spring Chinook, steelhead, bull trout
	Benefit Type: Reduction of entrainment mortality for juvenile ESA species
Metrics: 0.64 cfs; 38 stream miles affected	
Project Objectives and Description:	

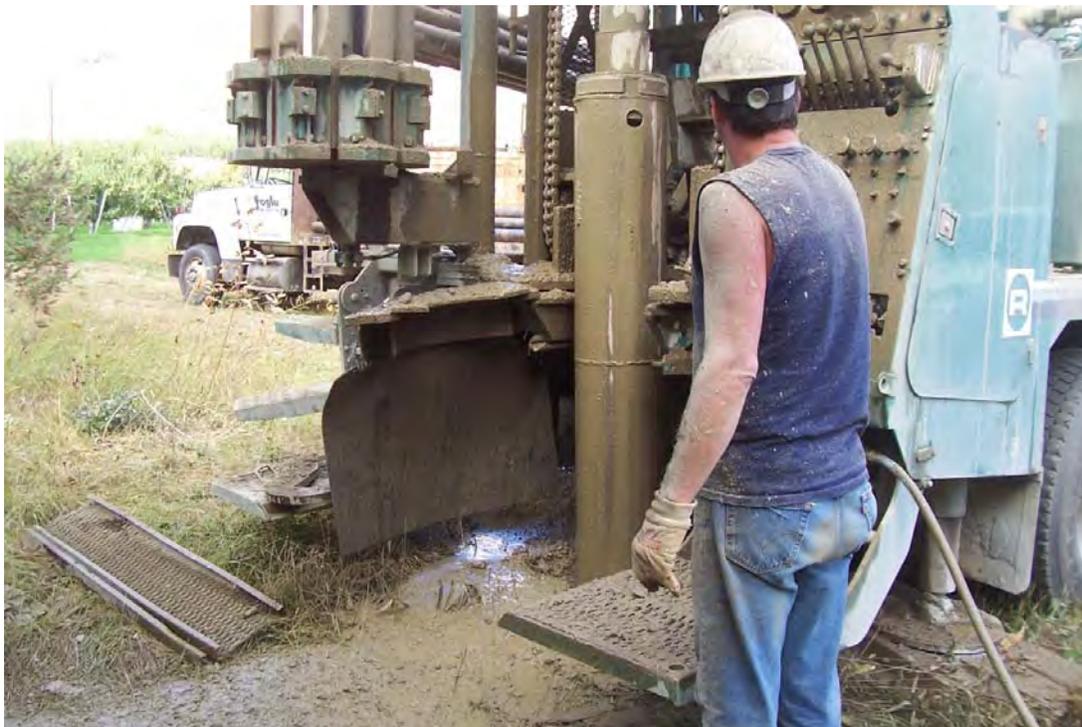
Project Name: Ecology Wells

Objectives were to reduce pump entrainment risk to juvenile ESA-listed fish species in the lower Entiat River by converting three existing surface water irrigation diversions to wells, and improve instream flow to the Entiat River. This was accomplished by drilling three irrigation wells, serving two orchards and a vineyard, and plumbing them to existing water distribution systems.

Design, Permitting, and Construction Issues:

Three attempts were necessary at one site to drill a well capable of delivering the required volume of water, driving up costs and contracting complexity.

Gallery:



Ecology Wells Project: rotary drilling small well #3 (#1 capped, #2 decommissioned).



Ecology Wells Project: pump panel and discharge components during installation at the well.



Ecology Wells Project: completed well.

Preston Reach Project

Project Name: Preston Reach Project	
Project Type: Instream habitat complexity and riparian planting	
Project Sponsor: CCD	
Project Design: ICF International	
Landowner(s): private landowners	
Partners: CCD, USFWS, CDLT	Reclamation Development Costs:
Funding Source(s): Reclamation through ARRA	Implementation Cost: \$310,740.23
Project Location:	<i>State:</i> WA <i>County:</i> Chelan <i>Stream:</i> Entiat River <i>Latitude:</i> 47° 51' 39.24" N <i>Longitude:</i> 120° 25' 13.8" W <i>Local Landmark:</i> 3.5 miles upstream of USGS stream gage 12452800 <i>Township:</i> 27N <i>Range:</i> 19E <i>Section:</i> 11 <i>¼ Section:</i> SW
Project Status: Complete	
Project Phase: Monitoring	
Milestones	Funding: Secured Design: Completed Permitting: Completed Construction Start Date: August 30, 2010 Construction Completion Date: June 1, 2011
Contracting	Advertised: June 30, 2010
	Awarded: July 30, 2010
Biological Benefit	Species: Upper Columbia spring Chinook salmon, steelhead
	Benefit Type: Habitat cover and complexity, prevention of fine sediment loading to spawning gravels, riparian shading
Metrics: 0.16 miles of stream length affected	
Project Objectives and Description:	
Objectives were to: 1) prevent recruitment of fine sediment to a spawning reach for ESA-listed species; 2) provide instream habitat complexity and cover for ESA-listed species, and 3) re-establish	

Project Name: Preston Reach Project

a functional riparian vegetation buffer to a denuded section of river bank. This entailed reshaping approximately 700 feet of bank, installing 14 bank LWD complexity structures, and planting a 100-foot-wide riparian buffer.

Design, Permitting, and Construction Issues:

Loss of bank material during spring 2010 high flow and the resulting change in site conditions caused some difficulty since the design was based on pre-existing bank geometry. Subgrade materials had a higher than expected clay content which prevented adequate compaction around LWD structures, requiring the import of adequate fill at an additional cost. The clay also made difficult working conditions for the excavator.

Gallery:



Preston Reach Project: initial work on the project, looking upstream along eroded banks.



Preston Reach Project: finished project, looking downstream.



Preston Reach Project: completed riparian improvement area, enclosed by a deer fence.



Preston Reach Project: high water event during spring following construction, looking downstream.

METHOW RIVER SUBBASIN

The Methow River (HUC 17020008) is a tributary to the Columbia River at RM 523.9 and has a drainage area of about 1,820 square miles. The mainstem Methow River forms where the West Fork Methow and Lost River meet at RM 73. In 2011, one project was completed in the subbasin that increased instream flows.

ESA-listed fish species present in the river include UCR spring run Chinook salmon (endangered), UCR steelhead trout (threatened), and CR bull trout (threatened). Also present are UCR summer run Chinook salmon (not listed).

Projects

- Beaver Creek, Gold Creek, and Middle Methow Tributary Instream Flow Enhancement Project

Sponsors

- Washington Water Project of Trout Unlimited (TU-WWP)

Partners

- National Fish and Wildlife Foundation (NFWF)
- Bureau of Reclamation (Reclamation)
- Washington Department of Ecology (WDOE)
- Methow Salmon Recovery Foundation (MSRF)
- Bonneville Power Administration (BPA)
- Methow Conservancy
- Natural Resources Conservation Service (NRCS)

Funding Sources

- NFWF
- Reclamation
- BPA
- WDOE

- NRCS
- Yakama Nation

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Methow River	\$2,058,291

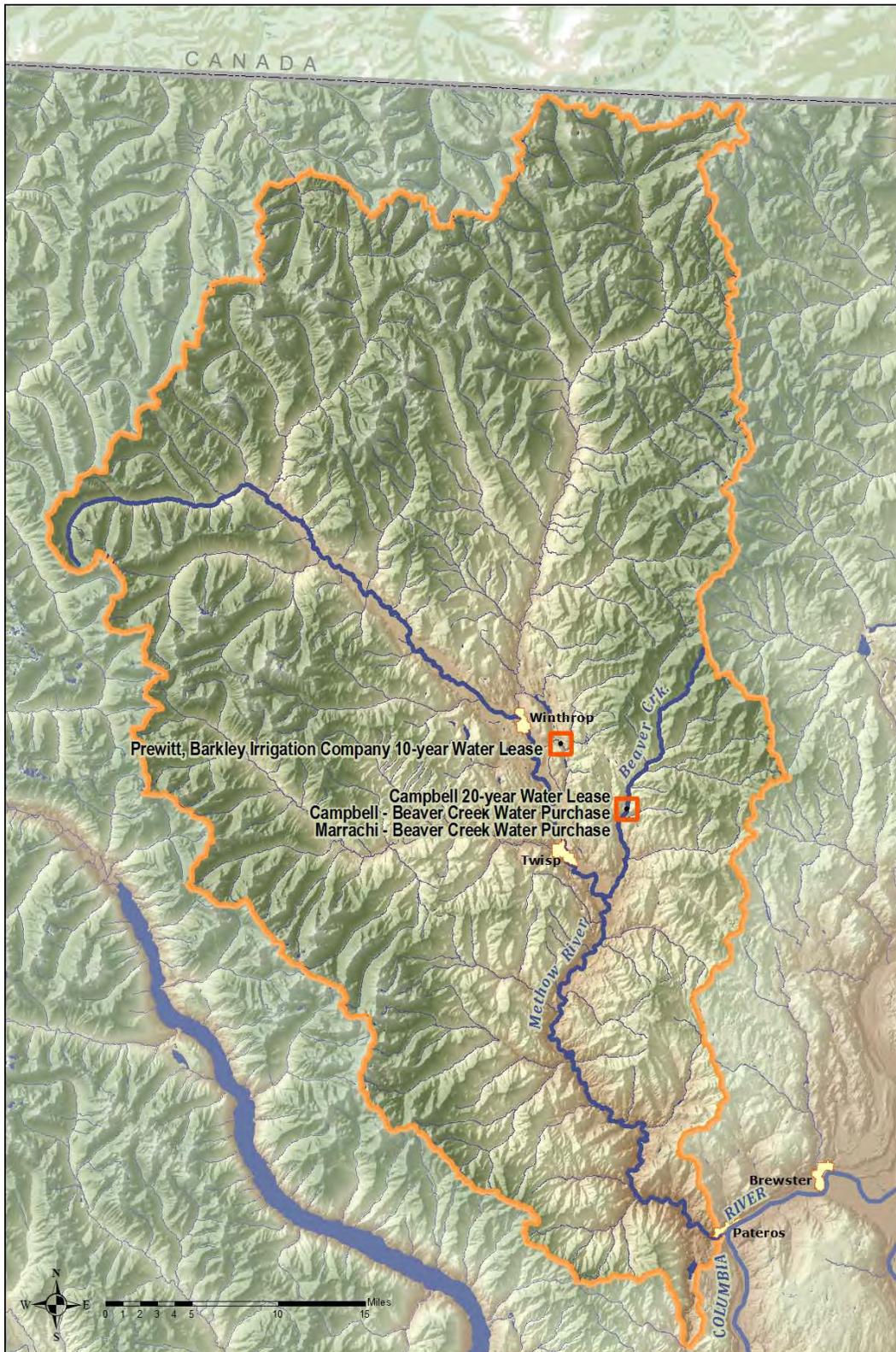


Figure 8. Location map of the projects completed in the Methow River subbasin in 2011.

Beaver Creek, Gold Creek, and Middle Methow Tributary Instream Flow Enhancement Project

Project Name: Beaver Creek, Gold Creek, and Middle Methow Tributary Instream Flow Enhancement in the Methow Basin	
Project Type: Permanent and Long-Term Leased Water Instream	
Project Sponsor: TU-WWP	
Landowner(s): private landowners	
Partners: NFWF, Reclamation, WDOE, MSRF, BPA, Methow Conservancy, and NRCS	Reclamation Development Costs: \$35,300
Funding Source(s): NFWF, Reclamation, BPA, WDOE, NRCS, & Yakama Nation	Implementation Cost: Approximately \$384,240
Project Locations:	Project Name: Campbell Permanent
	State: WA County: Okanogan Stream: Beaver Creek
	Latitude: 48° 24' 9.5" N Longitude: 120° 2' 31.71" W
	Township: 33 Range: 22 Section: 11
	Project Name: Campbell 20-Year Lease
	State: WA County: Okanogan Stream: Beaver Creek
	Latitude: 48° 24' 9.5" N Longitude: 120° 2' 31.71" W
	Township: 33 Range: 22 Section: 11
	Project Name: Marrachi Permanent
	State: WA County: Okanogan Stream: Beaver Creek
	Latitude: 48° 24' 9.5" N Longitude: 120° 2' 31.71" W
	Township: 34 Range: 22 Section: 35
	Project Name: Barkley Irrigation Company 10-Year Lease
State: WA County: Okanogan Stream: Middle Methow (Mainstem)	
Latitude: 48° 27' 17" N Longitude: 120° 07' 44" W	
Township: 33 Range: 22 Section: 05	
Project Status: Complete	
Project Phase: Annual compliance monitoring	

Project Name: Beaver Creek, Gold Creek, and Middle Methow Tributary Instream Flow Enhancement in the Methow Basin	
Biological Benefit	Species: Upper Columbia spring Chinook salmon, steelhead, Pacific lamprey, bull trout
	Benefit Type: All of these individual projects increase instream flows in tributaries of the Methow River and/or reaches of the mainstem that are flow limited or have been identified for off-channel habitat work where additional flows will be necessary. Increasing instream flows improve habitat by decreasing temperatures as well.
Project Descriptions:	
<u>BEAVER CREEK</u>	
<p>TU-WWP completed numerous projects in the Methow Basin during 2011. Those projects increased instream flows in key areas during the most important times of the irrigation season. All projects worked to improve habitat for ESA-listed species.</p> <p>In Beaver Creek, the following projects were accomplished as an essential contribution to the overall goal of stream and flow improvement. Beaver Creek is an important tributary to the Methow River that provides habitat for spawning and rearing steelhead, migrating bull trout, and rearing juvenile spring Chinook salmon. Unfortunately, one of its limiting factors is instream flows. Late season instream flows can average 7 cfs to 9 cfs; however, the flows have dropped as low as 4 cfs within the past decade. These flows are detrimental to salmon and steelhead production in this tributary.</p> <p>TU-WWP worked with two landowners on Beaver Creek to implement an innovative water deal of a split-season lease. This project type allows the landowners to continue agriculture production for most of the year and they shut off when flows begin to drop and additional water instream is most beneficial. The success of all of these projects demonstrates the power of working with one landowner to increase cooperation with other landowners in the small valley. TU-WWP and our partners are working on an overall strategy for Beaver Creek. These projects are particularly beneficial because Beaver Creek is adjudicated; therefore, water rights and quantities are known.</p> <p>There were three projects that were accomplished in Beaver Creek:</p> <ul style="list-style-type: none"> • The <u>Campbell Permanent</u> Project was a permanent acquisition resulting in up to 1.57 cfs increase in instream flow from August 1 to September 15. This project was finalized in late spring of 2011 and is protected instream for perpetuity. • The <u>Campbell Lease</u> Project was a 20-year lease resulting in up to 1.14 cfs increase in instream flow from August 1 to September 15. This project was also finalized in late spring of 2011 and is protected instream for 20 years. TU-WWP is currently working with the landowner to take this project from a 20-year lease to a permanent acquisition. • The <u>Marrachi</u> Project was a permanent acquisition resulting in up to 0.7 cfs increase in instream flow from August 1 to September 15. This project was finalized in the beginning of 2011 and is protected instream for perpetuity. 	

Project Name: Beaver Creek, Gold Creek, and Middle Methow Tributary Instream Flow Enhancement in the Methow Basin

MIDDLE METHOW / BARKLEY IRRIGATION COMPANY

Another project completed by TU-WWP is a 10-year lease with two large diverters of the Barkley Irrigation Company for 1.3 cfs and 521.18 acre-feet annually, beginning in 2011. This project was accomplished by an Agreement Not to Divert and to Lease Water Right. It ensures that the water will be available to benefit the numerous Methow River streamflow and side-channel enhancement projects that have been identified. The leased water is initially being used to augment instream flows in the Methow River. It is anticipated that it may be used to augment flows for the long term in a potential side-channel habitat improvement project in this portion of the Methow River.

TU-WWP has been in conversation with these landowners for over 5 years. By building relationships with these landowners, the agreement to get the water for 10 years is a huge step in the right direction and an important milestone considering the history of water conflicts in the Methow River basin and the importance of agriculture to the community. It is highly likely that the two landowners will consider the option of extending the lease period beyond 10 years.

TU-WWP worked closely with members of the Barkley Irrigation Company to support other instream flow projects. To date, the BIC has reduced its diversions at the headgate permanently by 5.09 cfs (from 26.0 to 20.91 cfs) through another Diversion Reduction Agreement with another landowner. This lease adds 1.3 cfs to the existing diversion reductions, bringing the total reduction to 5.82 cfs, and the maximum diversion rate down to 19.61 cfs.

The project completed in the Middle Methow Reach is described below.

This Barkley Irrigation Company Project was a 10-year lease resulting in 1.3 cfs and 521.18 acre-feet annually through the irrigation season of April 1 to October 31. This project was finalized in 2010 and the first year of implementation was in 2011.

WENATCHEE RIVER SUBBASIN

The Wenatchee River (HUC 17020011) is a tributary to the Columbia River at RM 468.4 and has a drainage area of about 1,350 square miles. There is a diversion weir at Wenatchee RM 17.5 serving the PUD and Wenatchee Reclamation District. In 2011, two projects were completed in the subbasin that improved adult and juvenile passage to habitat upstream.

ESA-listed fish species present in the river include UCR spring-run Chinook salmon (endangered) and UCR steelhead trout (threatened). Also present are UCR summer/fall-run Chinook salmon (not listed). The Yakama Nation has a Coho salmon reintroduction program in the subbasin.

Projects

- Peshastin Pipeline, Schedules A and B
- Upper Chumstick Barriers Project

Sponsors

- Chelan County Natural Resources Department (CCNRD)

Partners

- Cascadia Conservation District
- Washington Rivers Conservancy
- U.S. Fish and Wildlife Service (USFWS)

Funding Sources

- USFWS
- Community Salmon Fund
- Salmon Recovery Foundation Board
- Washington Conservation Commission

Bureau of Reclamation Expenditures in 2011

Subbasin	Expenditures
Wenatchee River	\$ 1,337,344

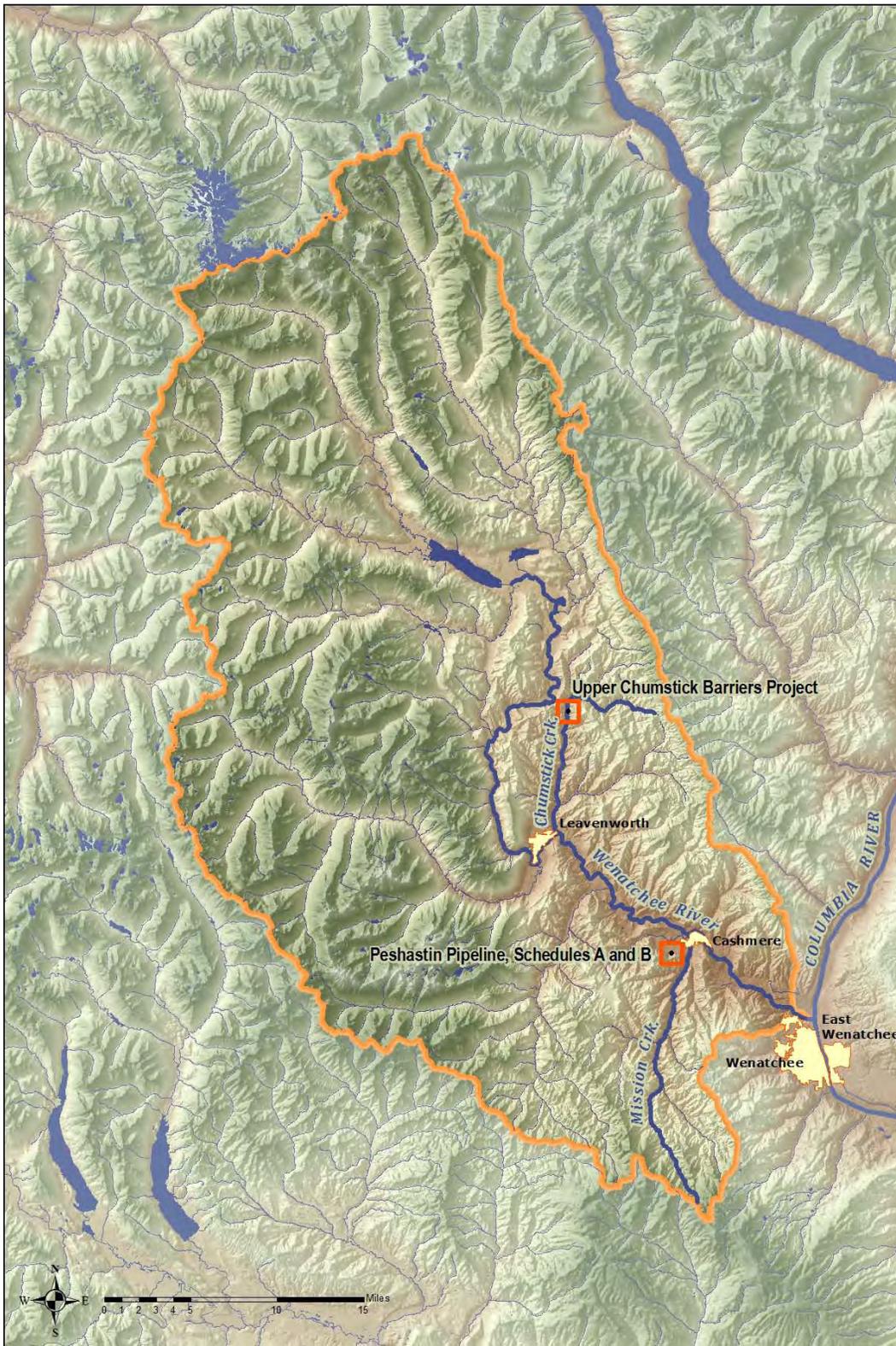


Figure 9. Location map of the projects completed in the Wenatchee River subbasin in 2011.

Peshastin Pipeline, Schedules A and B

Project Name: Peshastin Pipeline, Schedules A and B	
Project Type: Instream flow	
Project Sponsor: CCNRD	
Project Design: Anchor QEA	
Landowner(s): Various (Peshastin Irrigation District Easement)	
Partners: Washington Rivers Conservancy, Cascadia Conservation District	Reclamation Development Costs: \$150,000
Funding Source(s): Salmon Recovery Foundation Board, Washington Conservation Commission	Implementation Cost: \$1,047,000
Project Location:	<p><i>State:</i> WA <i>County:</i> Chelan <i>Stream:</i> Peshastin Creek</p> <p><i>Latitude:</i> 47⁰ 30' 21.99"N <i>Longitude:</i> 120⁰ 29' 48.60"W</p> <p><i>Local Landmark:</i> Begins just downstream of Brender Creek Crossing</p> <p><i>Township:</i> 23N <i>Range:</i> 19E <i>Section:</i> 5,6,7,8 <i>¼ Section:</i></p>
Project Status: Complete	
Project Phase: Monitoring	
Milestones	<p>Funding: Secured</p> <p>Design: Completed</p> <p>Permitting: Completed</p> <p>Construction Start Date: March 15, 2010 (Sched. A); September 26, 2011 (Sched. B)</p> <p>Construction Completion Date: April 15, 2010 (A), December 16, 2011 (B)</p>
Contracting	Advertised: September 7, 2009 (A); August 17, 2011 (B)
	Awarded: September 21, 2009, Mountain West (A); September 6, 2011, Olin Contracting (B)
Biological Benefit	Species: spring Chinook salmon, steelhead
	Benefit Type: Instream flow
Metrics: 360 acre-feet per year; 2.4 miles affected	

Project Name: Peshastin Pipeline, Schedules A and B

Project Objectives and Description:

The purpose of this project is to replace approximately 2 miles of leaking irrigation ditch with 36-inch and 10-inch pipe resulting in 360 acre-feet per year of water conserved to be placed in the Washington State Trust Water Program.

Design, Permitting, and Construction Issues:

Construction was delayed due to funding issues, which also caused the project to be built in two phases, Schedule A and Schedule B. Errors in the original survey led to adjustments during construction and resulted in additional costs. Project included construction of distribution box at the end of Schedule A. The pre-cast structure was not waterproofed as specified in the plans. Leaks were eventually addressed satisfactorily. Future structures will require cast in place construction.

Gallery:



Peshastin Pipeline, Schedules A and B Photograph: 36-inch-diameter HDPE pipe being placed as part of Schedule A.



Peshastin Pipeline, Schedules A and B Photograph: Schedule B junction structure construction.



Peshastin Pipeline, Schedules A and B Photograph: Schedule B turnout installation (typical).

Upper Chumstick Barriers Project

Project Name: Upper Chumstick Barriers Project	
Project Type: Barrier Removal	
Project Sponsor: CCNRD	
Project Design: Reclamation/USFWS	
Landowner(s): Private landowner	
Partners: USFWS	Reclamation Development Costs: \$100,295.91
Funding Source(s): USFWS and Community Salmon Fund	Implementation Cost: \$119,000
Project Location:	<i>State:</i> WA <i>County:</i> Chelan <i>Stream:</i> Chumstick Creek <i>Latitude:</i> 47° 42' 18" N <i>Longitude:</i> 120° 38' 20.4" W <i>Local Landmark:</i> 15600 Chumstick Hwy. <i>Township:</i> 26N <i>Range:</i> 18EWM <i>Section:</i> 31 ¼ <i>Section:</i> SE
Project Status: Completed	
Project Phase: Monitoring	
Milestones	<i>Funding:</i> Secured <i>Design:</i> Completed <i>Permitting:</i> Completed <i>Construction Start Date:</i> September 12, 2011 <i>Construction Completion Date:</i> November 11, 2011
Contracting	<i>Advertised:</i> July 5, 2011
	<i>Awarded:</i> July 25, 2011
Biological Benefit	<i>Species:</i> steelhead, spring Chinook salmon
	<i>Benefit Type:</i> Adult and juvenile passage
Metric: 1.8 miles, 0.3 miles to the next partial culvert barrier	
Project Objectives and Description:	
<p>This barrier removal is part of a larger project, the Chumstick Creek Barriers Project which will provide passage to 78 square miles of spawning, rearing, and overwintering habitat for steelhead, spring Chinook salmon, and bull trout. This project removes 3 irrigation diversions that are total passage barriers and replaces them with 6 rock weirs each for the lower and middle barriers (12 total) and a constructed roughened channel for the upper barrier. This allows passage for an</p>	

Project Name: Upper Chumstick Barriers Project

additional 1.8 miles upstream. However, there are three partial culvert barriers that exist in the 1.8 miles upstream that are scheduled for replacement in 2012 and 2013. The existing irrigation system was also updated with a fish friendly passive pump screen. For additional project details see the project page at <http://hwsconnect.ekosystem.us/Project/290/15958>.

Design, Permitting, and Construction Issues:

The designs were split between USFWS and Reclamation. The upper barrier was replaced by an experimental design by USFWS consisting of a constructed channel that was field designed/directed during construction. USFWS was able to permit this design by consultation with WDFW. Reclamation designed the rock weir/step pools for the middle and lower barriers following standard NOAA Fisheries Service criteria for jump height for fish passage.

The only construction issues were related to soils and sediment. There was a blue clay layer that was encountered while constructing the rock weirs. The specifications addressed this issue by requiring foundations to be over excavated and built up with streambed gravel in compacted lifts. This was performed on several weirs. Footer rocks, when placed on streambed gravel, were additionally compacted with the excavator until no visible settling occurred. There was also a significant amount of sediment impounded above the lower barrier. This barrier had the largest free water surface (pond) and was not over grown with reed canary grass like the middle and upper barriers which contributed to impounded sediment stability. The sediment was planted with live willow poles and sedge mats. This area can be expected to have a dynamic response during spring high flows as the channel adjusts.

The soils issue was unexpected. Several projects downstream of the project site did not reveal this layer and as a result, geotechnical exploration was not performed on this project prior to design. For future projects, performing geotechnical explorations are recommended to explore sediment above irrigation dams.

Gallery:



Upper Chumstick Barriers Project: view of upper barrier before project, looking upstream.



Upper Chumstick Barriers Project: view of upper barrier after project completion, looking downstream.



Upper Chumstick Barriers Project: view of middle barrier before project, looking upstream.



Upper Chumstick Barriers Project: view of middle barrier after project completion, looking upstream.



Upper Chumstick Barriers Project: view of lower barrier before the project, looking upstream.



Upper Chumstick Barriers Project: view of lower barrier weirs 1 and 2 after the project completion, looking upstream.



Upper Chumstick Barriers Project: lower barrier weirs 4, 5, and 6 after the project completion, looking downstream.