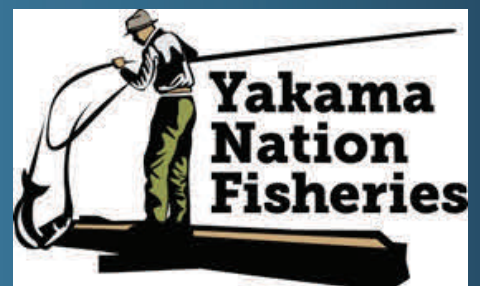


2013

**2008 Columbia River Fish Accords Implementation:
Yakama Nation Habitat Restoration Status and Trends**



Section 1 of a 4 part series



HONOR. PROTECT. RESTORE.

Foreword:



Yakama People have known since Time Immemorial that wild salmon need wild rivers to thrive, and we have lived within that balance for hundreds of generations. We also know that much of the wild salmon habitat we depended upon has been lost or degraded by human development of our watersheds. We understand that bringing back abundant wild salmon will require us to restore the habitats they need, and this has become one of this Nation's priorities for salmon recovery. Habitat restoration is about much more than the condition of the streams and rivers of the Yakama Nation. It is about restoring the river, fish, plants, animals and people as well. By restoring the river, we are helping to restore all the treaty-trust natural resources of the Yakama Nation. By understanding and supporting the restoration work that the Yakama Nation is doing as a result of the 2008 Columbia Basin Fish Accord, and by tracking the progress we are making, we have a chance to make sure the right actions are being implemented, and the trend is going in the right direction to make the entire ecosystem healthy once again. It is going to take a while, but we and our partners are working very hard to make sure we get there. This report shows examples of the many actions being taken by the Yakama Nation to correct the losses and restore balance to the needs of salmon as well as humans.

Virgil Lewis, Sr.

Chairman, Fish, Wildlife, and Law and Order Committee
Yakama Tribal Council

2013 Yakama Nation Fisheries Habitat Restoration Status Report

The Yakama Nation's Accord Implementation Status Report summarizes achievements in reaching salmon recovery goals described in the Columbia Basin Fish Accord agreement of 2008. The Accord is intended, in part, to allow for the implementation of projects and management actions considered necessary to improve the survival of salmon and steelhead listed under the Endangered Species Act to the levels described in the National Oceanic and Atmospheric Administration's 2008 Biological Opinion for Federal Columbia River Power System operations. The purpose of the status report is to: 1) track the effectiveness of efforts to implement the projects and management actions described in the Accord agreement, 2) report on the biological effectiveness of implemented projects and actions by monitoring trends in the status of ESA-listed salmon and steelhead populations, and 3) provide information to tribal leadership to aid in development of policy direction. This report will consist of four chapters, three of which will document progress in implementing projects and management actions that improve: 1) salmon habitat, 2) hatchery supplementation, and 3) hydrosystem operations. The fourth chapter will document the status and trends in abundance of ESA-listed salmon and steelhead and other species of priority to the Yakama Nation. Leading up to the release of the comprehensive report, the individual chapters will be available to the public upon completion.

The sections are:

- I — Habitat Restoration
- II — Species Status and Trends
- III — Hatchery and Supplementation
- IV — Hydrosystem Operation

To ensure the reports reflect current and relevant information, each chapter and the supporting website will be updated regularly.

To learn more about the Yakama Nation Fisheries Status and Trends project, to download this report and see a more detailed version, please visit www.yakamafish-nsn.gov/restore/projects/star. There, you can also leave comments and alert us to any errors or omissions.



Background and Focal Species

On May 2, 2008, the Yakama Nation signed the Columbia Basin Fish Accords Memorandum of Agreement which provides funds to implement fish and wildlife restoration projects throughout Yakama Nation's Ceded Lands, as well as other areas utilized by aquatic treaty-trust* species. This report summarizes the Yakama Nation's progress, since 2008, towards achieving Columbia Basin Fish Accords habitat restoration goals.



Restoring the natural habitats needed by wild salmon, steelhead, and lamprey is among the highest priorities for Accord funding. ESA-listed species must be able to sustain themselves in their natural habitats, thus their habitats must be healthy, accessible, and abundant to reach delisting goals. The Yakama Nation is implementing a broad



set of actions to restore natural stream function. Because all aquatic resources hold great value to the people of the Yakama Nation, the status and trends of additional species will be described in upcoming reports.

**Yakama Nation Treaty of 1855 (12 stat. 951) with the United States of America.*



Major Habitat Ecological Concerns for Chinook Salmon, Steelhead, and Pacific Lamprey in the Yakama Nation's Treaty Trust Resource Areas



Ecological Concern: Reduced channel complexity

Major Causes: Agriculture and forestry practices

Effects: Loss of in-stream habitat such as wood and substrates. Decline of essential depth and pool variability.



Ecological Concern: Loss of riparian vegetation

Major Causes: Agriculture and forestry practices

Effects: Loss of natural shade and in-stream cover, bank erosion, and decreased ability to filter sediment.



Ecological Concern: Streambed channelization

Major Causes: Road construction

Effects: Loss of natural stream form, flow patterns altered, loss of suitable substrates due to increased flow velocities.



Ecological Concern: Altered hydrology and water quantity

Major Causes: Hydro-operations and agriculture practices

Effects: Loss of access to habitats. Natural flows and the timing of those flows are altered causing spawning, rearing, and migration challenges for native fish.



Ecological Concern: Low productivity/ high competition

Major Causes: Loss of nutrients and increased non-native fish

Effects: Reduction in availability of food for native fish.

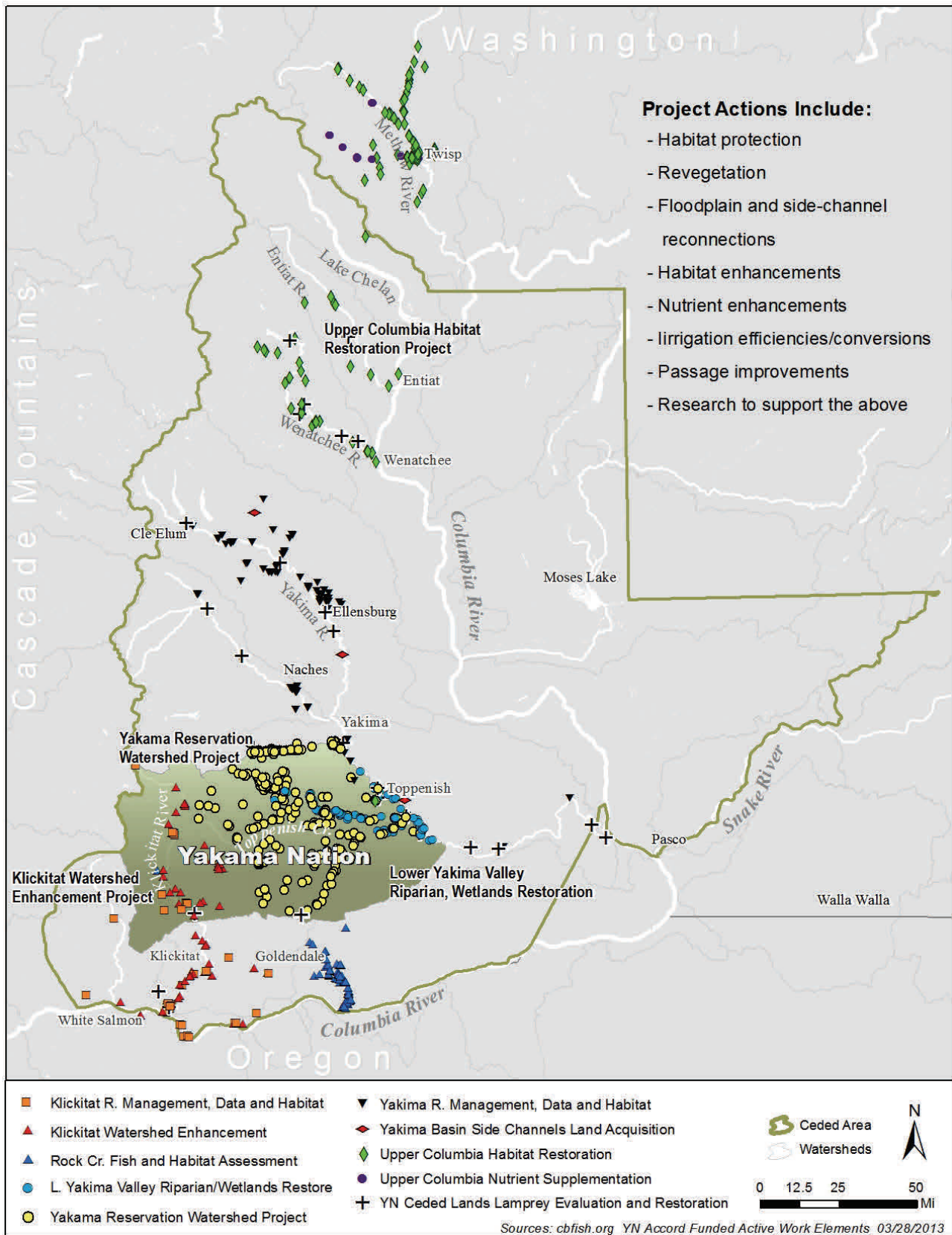


Ecological Concern: Altered hydrology and water quantity

Major Causes: Hydro-operations and agriculture practices

Effects: Loss of access to habitats. Natural flows and the timing of those flows are altered causing spawning, rearing, and migration challenges for native fish.

Yakama Nation Accord-Funded Habitat Restoration Projects



Yakama Nation Accord-Funded Habitat Restoration Actions Addressing Ecological Concerns (2008 – Present)*



Ecological Concern:
Loss of riparian vegetation

Actions: Plantings, maintenance, fencing, and weed removal

Project Actions: 107

Benefits: Increased shading, reduced erosion, increased food sources, habitat complexity



Ecological Concern:
Streambed channelization

Actions: Decommission/remove roads, realign/connect/create side channels, create/restore/enhance wetlands and floodplain

Ecological Concern:
Reduced channel complexity

Actions: Install structures to increase in-stream complexity, create new channels, wetland/floodplain reconnection

Project Actions: 69

Benefits: Increased habitat quantity/quality, water quantity/quality

Project Actions: 24

Benefits: Increased habitat complexity, increased sinuosity, reduced erosion



Ecological Concern:
Low productivity/ high competition

Actions: Carcass plantings, invasive species control, and research

Project Actions: 39

Benefits: Improved flow, habitat quantity, water quality

Project Actions: 4

Benefits: Improved quality and quantity of available food

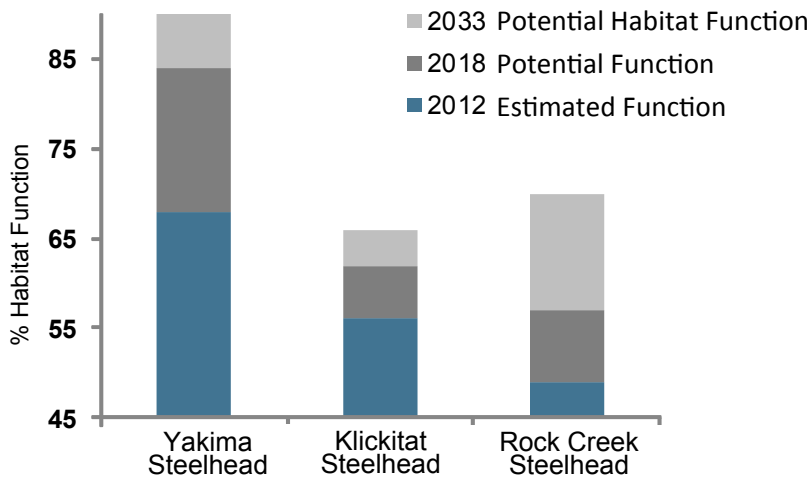
Ecological Concern:
Altered hydrology and water quantity

Actions: Install fish passage structures, screening, remove barriers, acquire water rights, improve irrigation efficiency, (also, restore watershed)



**For a comprehensive list of planned and completed activities, please visit www.yakamafish-nsn.gov*

Yakima/ Klickitat — Percent Improvement in Habitat Quality

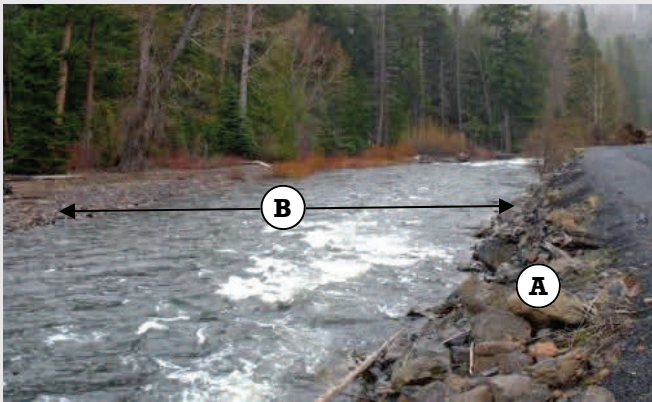


Yakama Nation Fisheries Program staff and other experts estimated the current health of habitat for fish, as well as future conditions following completion of the 2008 Accords restoration projects.

Habitat function is estimated based on the degree to which habitat conditions affect the health of fish populations. Restoration actions are intended to reverse the impact of past land use practices that have impaired habitat function.

Following are examples of the types of actions that the Yakama Nation has implemented to improve habitat conditions for fish.

PROJECT SPOTLIGHT: Upper Klickitat River In-Channel and Floodplain Enhancement Project



Started on April 24, 2010 | Completed on November 2, 2010; Accord-funded

Problem

Road development resulted in changes to the river that negatively affected steelhead and spring Chinook. When the road was built, rocks (A) were installed along its edge to prevent damage by the river. The road and rock combination caused the river to become “channelized” (B) which resulted in the loss of its the natural meandering pattern. In addition, large wood that provided places for fish to feed and live throughout their lives was altered or removed.

Restoration Actions

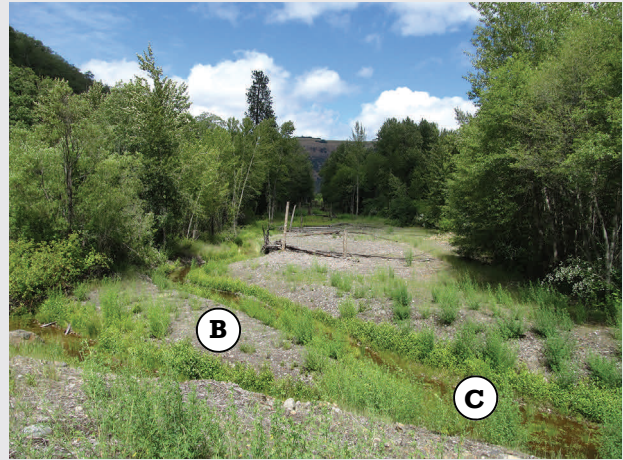
To improve habitat complexity, water quality, and reduce channelization, the Yakama Nation replaced the uniform rock structure with 65 log jams (C), strategically placed boulders, reconnected or created 0.5 miles of side-channel, stabilized 0.5 miles of streambank, planted riparian vegetation, and created numerous pools.

Benefits

Returning 1.68 miles of the river to a more complex configuration, the Yakama Nation restored productive spawning, rearing, and holding habitat for salmon, steelhead, and other fish and wildlife species. Additional benefits to the Yakama Nation are reduced road maintenance costs.

Project Implementation — Project Spotlights

PROJECT SPOTLIGHT: Klickitat River Floodplain Restoration Project (“Haul Road Removal”)



Started in 2001 | Phase 4 In-Progress 2013; Multiple Funding Sources and Partners (Including the Salmon Recovery Funding Board and YN-Accord)

Problem

Eighty years ago, a railroad grade was built along the Klickitat River to haul timber to the mill downstream. Converted to asphalt in the 1950s (A), the road became unnecessary when the mill closed in the early 1990s. Located in the active floodplain, parts of the deteriorating road washed out in 1996. The road impeded the natural river function, restricting fish habitat development, simplifying the river, and impacting overall river health.

Restoration Actions

To restore natural river processes and healthy fish habitat, 4.35 miles of the road, fill, and rip-rap were removed (B), river banks re-sloped, and riparian areas revegetated. Asphalt was also removed along 8 miles of road. Floodplains, tributaries, and side channels were reconnected, culverts removed, and roughness elements installed.

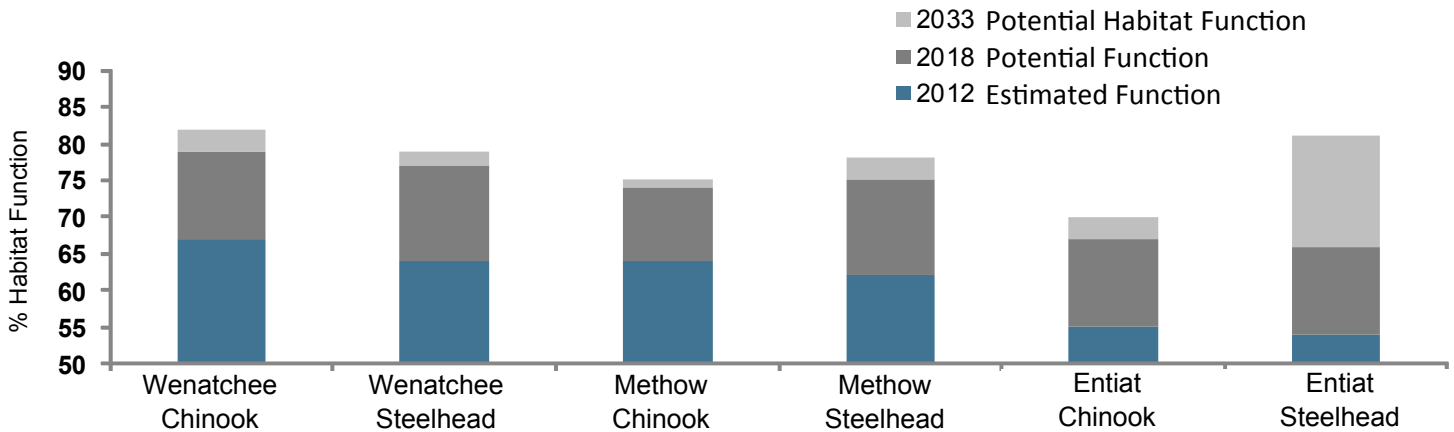
Benefits

Restoration efforts have led to healthy river functions in priority fish habitat areas, creation of and connection to secondary channels (C), and restoration of riparian and floodplain areas. This provides increased habitat quantity and quality for fish and wildlife using the riparian and floodplain areas.

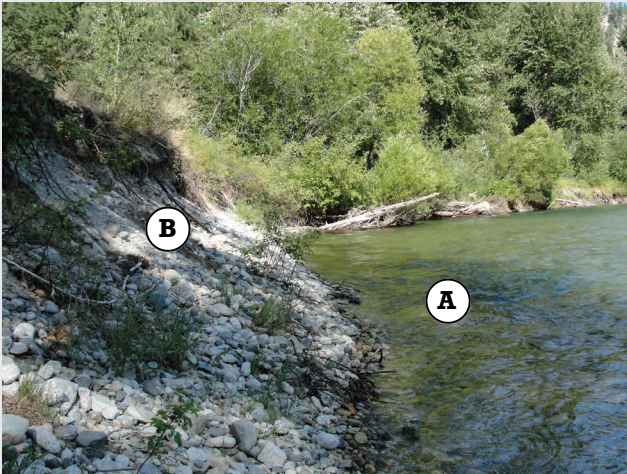


Aerial photos (at left) reveal a change in the landscape after the Haul Road was removed. In 1996, the straight roadbed is clearly visible (1). In 2013, the roadbed has been removed, a side-channel has developed and stream-side vegetation has become established (2).

Upper Columbia — Percent Improvement in Habitat Quality



PROJECT SPOTLIGHT: Entiat River “3-D” Habitat Enhancement Project



Started on July 16, 2011 | Completed on October 31, 2012; Accord-funded

Problem

Past land use practices reduced the amount of large wood in a section of the Entiat River. The reduction of wood resulted in the loss of fish habitat quantity and complexity (A), as well as greater river movement and bank erosion (B) compared to similar river reaches that were not impacted. The prior land use practices also reduced off-channel rearing habitat.

Restoration Actions

To improve habitat complexity and quantity, improve floodplain connection and reduce erosion rates, seven log structures (C) were constructed. In addition, 0.75 miles of off-channel habitats were created at five locations, and 9 acres of streamside (*riparian*) area were planted with native vegetation.

Benefits

The engineered log structures have helped to create pools for fish habitat, provide refuges during high flows and capture additional wood that helps to stabilize the migrating channel as well as increase habitat complexity. The addition of off-channel rearing habitats has benefited juvenile fish in numerous ways. As the native vegetation plantings age, they will help to increase fish habitat complexity and stability.

Project Implementation — Project Spotlights

PROJECT SPOTLIGHT: Chewuch (Methow) River Mile 10 Fish Habitat Enhancement Project



Started on September 12, 2011 | Completed on October 19, 2012; Accord-funded

Problem

Due to past land use practices, as well as riprap along the streambank, River Mile 10 of the Chewuch River was lacking instream habitat complexity and off-channel habitats. These conditions provided little opportunity for the recruitment of woody material. In addition, the channel had become unstable and disconnected from the floodplain. To compound the habitat deficiencies, an undersized culvert was also present. Since the location is considered a critical area for threatened and endangered fish, addressing the limiting factors was a priority.

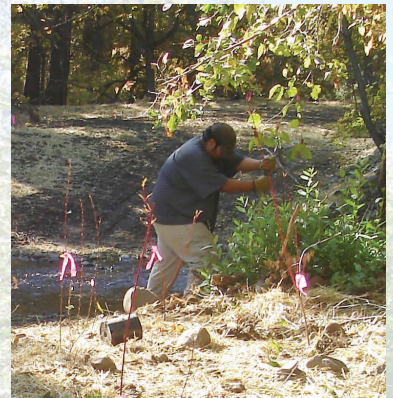
Restoration Actions

To restore River Mile 10, 0.25 miles of off-channel habitat was created (A), 1.64 acres of stream-side (riparian) area were planted with native vegetation (B), the undersized culvert was removed, and 8 engineered log structures were installed (C) totaling 0.85 miles of restored river. To further enhance fish populations in the Chewuch River, the Yakama Nation is implementing similar actions at River Mile 8 and has proposed work from River Mile 11.75 to River Mile 13.

Benefits

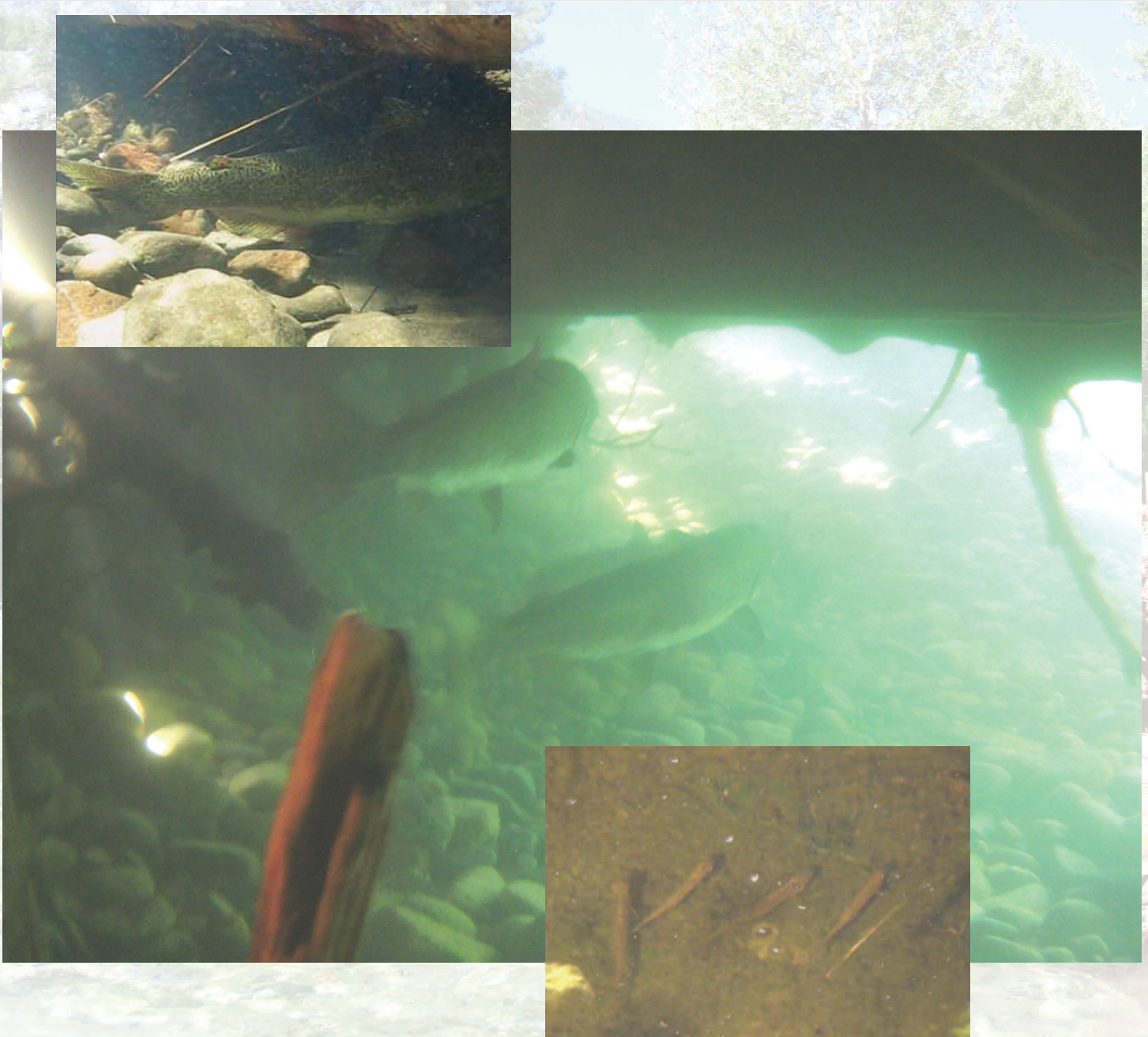
By creating off-channel habitat and improving stream-side habitat complexity, rearing and holding habitat was provided for juvenile and adult fish. Benefits from the work were realized almost immediately as steelhead were observed in the side-channel five days after construction (D). Stabilizing streambanks, reconnecting the floodplain, and planting riparian vegetation has helped the river function in a natural and healthy manner which will help create and maintain fish habitat into the future. Primary fish species benefiting from these efforts include spring Chinook, steelhead, bull trout, and other resident fish.

Examples of Yakama Nation restoration work and the people making it happen.



“The balance for all of our survival, that depends on the balance between these fish, this forest, the water and one is not without the other.”

Yakama Nation Councilwoman Stella Washines



Examples (above) of fish using restored habitats immediately following the completion of projects by the Yakama Nation. Clockwise from top to bottom: Klickitat River Meadows Restoration, 3-D Habitat Enhancement (Entiat Subbasin), Goodfellow Side-Channel Reconnection (Wenatchee Subbasin) (Photos, YN).



Photo Credits

Photo	Credit	Year	Page
Panther Creek Fish Passage Barrier Removal, Yakima Subbasin	K. Clayton, YN	2011	Cover
Klickitat Meadows Restoration, Upper Klickitat Subbasin	W. Conley, YN	2004	Cover
3-D Habitat Enhancement, Entiat Subbasin	C. Clemmons, YN	2012	Cover
Goodfellow Floodplain Reconnection, Wenatchee Subbasin	J. Breidert, YN	2010	Cover
Hancock Spring, Methow Subbasin	J. Jorgensen, YN	2012	Cover
Councilman Virgil Lewis, Sr.	Darla Leslie, YN Review		-
Focal Species: Steelhead	E. Keeley	NA	3
Focal Species: Spring Chinook	E. Keeley	NA	3
Focal Species: Pacific Lamprey	R. Lampman, B. Jenkins	YN/ ODFW	3
Ecological Concerns (Reduced Channel Complexity): Toppenish Creek, Yakima Subbasin, Reach Assessment	YN	2011	4
Ecological Concerns (Loss of Riparian Vegetation): Toppenish Creek, Yakima Subbasin, Yakama Reservation Watershed Project	YN	2007	4
Ecological Concerns (Streambed Channelization): Little Rattlesnake Creek, Naches Subbasin	J. Mathews, TFW-YN	2013	4
Ecological Concerns (Low Productivity/Competition): Carcass Twisp River, Natural Production Restoration Project	John Jorgensen, YN	2012	4
Ecological Concerns (Altered Hydrology and Water Quantity): Tepee Creek, Klickitat Watershed Enhancement Project	W. Conley, YN	2004	4
Ecological Concerns (Altered Hydrology and Water Quantity): Peshastin Creek, Wenatchee Subbasin, Reach Assessment	Interfluve for YN	2010	4
Ecological Concerns background photo: Hancock Springs (Methow)	J. Jorgensen, YN	2012	4
Addressing Ecological Concerns (Loss of Riparian Vegetation): Panther Creek, Yakama Reservation Watershed Project	K. Clayton, YN	2013	6
Addressing Ecological Concerns (Reduced Channel Complexity): Hancock Springs (Methow)	J. Jorgensen, YN	2009	6
Addressing Ecological Concerns (Streambed Channelization): Klickitat River Floodplain Restoration Project Phase 2	W. Conley, YN	2011	6

Photo	Credit	Year	Page
Addressing Ecological Concerns (Low Productivity/Competition): Yakima River Coho Project	T. Newsome, YN	2009	6
Addressing Ecological Concerns (Altered Hydrology and Water Quantity): Toppenish Creek Culvert, Removal Yakima Subbasin, Yakama Reservation Watershed Project	S. Adams, YN	2008	6
Addressing Ecological Concerns background photo: Little Rattlesnake Creek, Naches Subbasin	J. Mathews, TFW-YN	2013	6
Project Spotlight: Upper Klickitat River In-Channel and Floodplain Enhancement Project	D. Lindley, N. Romero, YN	2007, 2010	7
Project Spotlight: Klickitat River Floodplain Restoration Project	W. Conley, YN	2009, 2012	8
Aerial photos	Google Earth	2013	8
Project Spotlight: 3D Project, Entiat Subbasin	C. Clemmons, YN	2010, 2012	10
Project Spotlight: Chewuch (Methow) River Mile 10 Fish Habitat Enhancement Project	C. Butler, YN	2011, 2012	11
Photo collage: Rentchlers Meadow restoration, upper Satus Creek	YN	2003	12
Photo collage: Panther Creek monitoring, upper Satus Creek	K. Clayton, YN	2013	12
Photo collage: Panther Creek restoration, Upper Satus Creek	K. Clayton, YN	2013	12
Photo collage: Juvenile lamprey restoration, Prosser Hatchery (Ralph Lampman)	E. Washines, YN	2013	12
Photo collage: Panther Creek restoration upper Satus Creek	K. Clayton, YN	2013	12
Photo collage: Hancock Springs Restoration, Methow subbasin	J. Jorgensen, YN	2009	12



HONOR

PROTECT

RESTORE



This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, under Project No. 200900200, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries.

