Fish Passage Restoration on Timber and Rose Creek

State(s): Wyoming
Managing Agency/Organization: Wyoming Game and Fish Department
Type of Organization: State
Project Status: Ongoing
Project type: WNTI Project
Project action(s): Barrier removal and construction, watershed connectivity, and monitoring. This project will reconnect 11 miles of stream, remove 11 barriers, and build an additional barrier to prevent invasive species encroachment.
Trout Species Benefitted: Yellowstone Cutthroat Trout

Population: Greybull River, Wind River Basin

Project summary: The Greybull River drainage supports the second largest genetically pure Yellowstone Cutthroat Trout (YCT) population in Wyoming and is home to the largest population in the Bighorn/Wind River Basin with seven core conservation populations. The Greybull drainage serves as a metapopulation where YCT, Mountain Whitefish (MWF), and Mountain Sucker (MTS) migrate between the Greybull, Wood River, and tributary streams throughout their life cycle. Enhancing connectivity in the Greybull River drainage is key for long-term resilience of native populations of YCT, MWF and MTS. When completed, this project will restore upstream passage to over 46 miles of critical habitats within a large and key watershed for YCT and other aquatic organisms. Screening of the diversions will prevent the loss of up to 60,000 YCT per year. This project funding will implement the second and final construction phase, planned for the summer of 2026. During this second phase, full passage will be restored on Timber Creek and Rose Creek by removing 11 barrier structures and restoring passage to 11 miles of stream habitat. These conservation efforts will yield a great deal of resilience to YCT populations in the face of natural and manmade disturbances such as drought, climate change, floods and wildfire.

Problem the Project Addresses: The Greybull River drainage supports the second largest genetically pure Yellowstone Cutthroat Trout (YCT) population in Wyoming and is home to the largest population in the Bighorn/Wind River Basin with seven core conservation populations. The Greybull drainage serves as a metapopulation where YCT, Mountain Whitefish (MWF), and Mountain Sucker (MTS) migrate between the Greybull, Wood River, and tributary streams throughout their life cycle.

Enhancing connectivity in the Greybull River drainage is key for long-term resilience of native populations of YCT, MWF and MTS. Enhancing connectivity is a priority for the Wyoming Game and Fish Department (WGFD), Meeteetse Conservation District, Greybull Valley Irrigation District, Trout Unlimited, U.S. Forest Service, and private landowners. To date, 170 miles of upstream fish passage have been provided within the drainage through the installation of two fish ladders on channel spanning irrigation diversions and the replacement of impassable road crossings on the Wood River, Franc's Fork, Greybull River and the upper portions of Timber Creek. The successful implementation of these past projects are creating new connectivity opportunities. The Pitchfork Ranch (Ranch) has partnered with the WGFD, Meeteetse Conservation District, Trout Unlimited, and the Greybull Valley Irrigation District to restore upstream passage and prevent the loss of fish into irrigation ditches across the Ranch. Restoration of passage on the Ranch will eliminate all barriers to spawning tributaries in this 328 square mile portion, or 40%, of the watershed and approximately 200 miles of stream that provides all necessary habitat features to meet YCT and other native fish life history needs.

The Ranch contains four tributaries to the Greybull River that together contain over 46 miles of high quality spawning, rearing, and overwintering habitat for YCT, MWF and MTS. However, for many decades, five active diversions, four abandoned diversions, and seven road crossings on the Ranch have impeded upstream passage and entrainment thousands of fish each year. WGFD and their partners have studied and documented the barriers and entrainment over 14 years. During the planning and design phases of this project, fish passage inventories, entrainment studies, and hydraulic modeling were conducted to understand the type and severity of barriers and entrainment that is occurring. Results of these studies along with the proven project success in the drainage have resulted in the Ranch's full support for the restoration of connectivity across their Ranch. WGFD and their partners are taking this watershed level approach on the Ranch to restore connectivity to 46 miles of high quality habitat and prevent the loss of up to 60,000 YCT to five irrigation diversions each year. The Ranch represents the largest private land holder in the Upper Greybull watershed and restoration of passage on their property will eliminate all barriers to spawning tributaries in this 328 square mile portion of the watershed. Enhancing connectivity in the Upper 40% of the watershed is key for long-term resilience of YCT, MWF and MTS.

The magnitude of the restoration that is needed logistically requires WGFD to implement these projects in two phases. The first phase will focus on screening and passage restoration on four of the irrigation diversions

located on four streams on the Ranch. Construction of the first phase is planned for fall 2025. This WNTI funded project implements the second phase of construction, planned for 2026. During the second phase, full passage will be restored on Timber Creek and Rose Creek by removing 11 barrier structures and restoring passage to 11 miles of stream habitat. When fully implemented, this project will restore upstream passage to over 46 miles of critical habitats within a large and key watershed for YCT and other aquatic organisms. Screening of the diversions will prevent the loss of up to 60,000 YCT per year. These conservation efforts will yield a great deal of resilience to YCT populations in the face of natural and manmade disturbances such as drought, climate change, floods and wildfire.

Objectives:

- Reclaim abandoned irrigation diversions and provide upstream passage up to bankful conditions for all life stages of Yellowstone Cutthroat Trout and adult Mountain Suckers.
- Provide a stable point of diversion for the Rose Creek diversion and deliver up to 5.05 cfs to the diversion.
- Maintain natural, stable channel conditions at all points of diversion.
- Install a corrugated water screen on Rose Creek to prevent loss of all life stages of fish into the canal.
- Install siphon on the Jevons irrigation ditch, under Rose Creek, to transport a minimum of 7.57 cfs of irrigation water from the Greybull River and tailwater from Pickett Creek to prevent the transbasin movement of Brook Trout into Rose Creek.
- Replace undersized culverts with structures that provide upstream fish passage on Timber Creek and Rose Creek up to bankful events and can transport a 25-year flood event without overtopping the road.

Partners:

- Pitchfork Ranch
- Wyoming Game and Fish Dept.
- Meeteetse Conservation District
- Trout Unlimited
- Greybull Valley Irrigation District

- Wyoming Wildlife Natural Resource Trust
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Western Native Trout Initiative

Project Monitoring: A cooperative agreement (CA) will formalize the roles and responsibilities of all parties to ensure the project's success. The monitoring and adaptive management plan falls within three primary areas as outlined below:

1) In-Stream Structures: To monitor the function of all structures in the project site, a rapid assessment will be employed annually during low flow conditions for a minimum of three years. If monitoring reveals instabilities that would undermine the project, the WGFD will take corrective action.

2) Rose Creek: The entrainment rate of fish and upstream passage will be monitored for at least two years. The fish screen will be evaluated by completing an entrainment study during the peak out-migration of YCT. A trap net will be set behind the fish screen in the canal and monitored for a 24-hour period once a week to ensure no fish are entrained and the screen is successful.

3) Timber Creek: Monitoring will focus on documenting the number and size of YCT and MTS making it upstream past the project area. Solar power stations, PIT tag readers and antennas will be installed in three to four different locations on followed by sampling fish. A target of 500 fish greater than or equal to six inches will be individually tagged with a uniquely numbered PIT tag into the peritoneal cavity. The project will be monitored for a minimum of two years following construction.

Fish surveys were conducted in 2023 to assess the presence and distribution of fish species in Timber Creek upstream of the project area. These fisheries surveys will be repeated in years 2, 5, and 10 following construction. If the PIT tag study and the fish surveys indicate that no change has occurred in species presence, then the WGFD would consider corrective action.

Funding Source(s): National Fish Habitat Action Plan

Project cost: \$75,000 WNTI funds, Total project cost \$1,393,792

Start Date: 07/15/2026 Completion Date: 10/31/2026

Project Contacts: Laura Burckhardt, Wyoming Department of Game and Fish, laura.burckhardt@wyo.gov