

East Tensleep Creek Conservation Barrier

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 construction, stream habitat restoration, and population assessment. One barrier will be constructed, one population of Yellowstone Cutthroat Trout will be assessed, and 31 miles of stream habitat will be restored.

Trout Species Benefitted: Yellowstone Cutthroat Trout

Population: East Tensleep Creek, Nowood River

Project summary: Project partners aim to conserve the Yellowstone Cutthroat Trout, a native species that has lost most of its historic range in the Bighorn Mountains, including near-total extirpation in the Nowood River watershed. East Tensleep Creek's headwaters are home to one of the last endemic Yellowstone Cutthroat Trout populations within the watershed, confined to the upper two miles of habitat due to competition and predation by non-native Brown and Brook trout. Action is needed to protect this population from further decline and to secure its long-term survival.

We have the following three objectives:

1. construct a fish barrier 1,100 feet upstream of Meadowlark Lake to prevent upstream migration of non-native trout and thereby protect the drainage
2. remove non-native trout from upstream area above the barrier to eliminate competition and predation pressures on Yellowstone Cutthroat Trout, and restore and expand habitat for Yellowstone Cutthroat Trout, increasing their accessible range from 2 to 31 miles within the East Tensleep Creek drainage above Meadowlark Lake.

Currently, non-native trout dominate most of East Tensleep Creek and Meadowlark Lake, limiting Yellowstone Cutthroat Trout to the upper two miles of the drainage. Meadowlark Lake, 19 square miles, is known for offering some of the best trout fishing in the Bighorn Mountains, making it a highly popular destination for anglers. Given its popularity, it is not feasible to eliminate the non-native sport fisheries entirely. Project partners aim to provide quality habitat above Meadowlark Lake by removing non-native species and creating 31 interconnected stream miles free from competition and predation for Yellowstone Cutthroat Trout. The unobstructed section of East Tensleep Creek will provide diverse habitats, ranging from rearing to spawning areas. Additionally, installing a fish barrier will ensure long-term protection for Yellowstone Cutthroat Trout upstream of the barrier and support a thriving aquatic ecosystem.

Three restoration methods will take place. First, for barrier construction, the barrier will be designed as a 5-foot-tall jumping-and-velocity structure, effectively blocking upstream migration of non-native species from Meadowlark Lake. Second, removal of non-native trout with rotenone upstream of the barrier. All necessary hydrologic data has been collected in order to draft a chemical treatment plan. Additionally, all federal authorizations/permits necessary for the use of rotenone on federal land are complete and in-hand. Once all non-natives have been removed, genetically pure Yellowstone Cutthroat Trout will be stocked into the East Tensleep Creek watershed. The genetically pure Yellowstone Cutthroat Trout will be retrieved from a nearby source within the Nowood River drainage. Third, post-restoration monitoring of physical habitat and the distribution and abundance of Yellowstone Cutthroat Trout will occur.

Problem the Project Addresses: In the Nowood River watershed, Yellowstone Cutthroat Trout populations have been nearly extirpated; the last remaining endemic population is restricted to

the upper two miles of East Tensleep Creek. This vital population is at high risk of loss due to predation and competition from non-native trout species, including Brown and Brook trout, which dominate the watershed and Meadowlark Lake. Without intervention, this population will eventually be lost.

East Tensleep Creek historically supported robust Yellowstone Cutthroat Trout populations, but their abundance and distribution have declined due to non-native trout stocking from 1935 to 1954. As a result, Brown and Brook trout have become widespread and self-sustaining, largely displacing Yellowstone Cutthroat Trout. Current habitat conditions reflect fragmented habitat and encroachment of non-native trout. These conditions limit the watershed's healthy functioning and prevent Yellowstone Cutthroat Trout from expanding its range.

This project is critical to the recovery and long-term persistence of Yellowstone Cutthroat Trout in East Tensleep Creek and the broader Nowood River watershed. The Yellowstone Cutthroat Trout is a Species of Greatest Conservation Need in Wyoming. Its persistence depends on proactive conservation efforts to prevent threats posed by non-native species and habitat fragmentation. By addressing these threats, this project will contribute to the long-term stability of Yellowstone Cutthroat Trout populations and align with regional and national priorities for native trout conservation.

Objectives:

- Design and construct a conservation fish barrier in the East Tensleep Creek watershed to prevent the upstream migration of non-native Brown and Brook trout from Meadowlark Lake. This barrier will protect and open 31 miles of stream habitat for Yellowstone Cutthroat Trout (Yellowstone Cutthroat Trout).
- Expand and increase Yellowstone Cutthroat Trout populations by removing non-native trout and reintroducing Yellowstone Cutthroat Trout to create a robust, stable and genetically pure population in East Tensleep Creek.
- Remove non-native trout species using both mechanical and chemical methods from East Tensleep Creek to reduce competition and predation pressures on native Yellowstone Cutthroat Trout.

Partners:

- Wyoming Game and Fish Department
- Bighorn National Forest
- National Stream and Aquatic Ecology Center (NSAEC)
- Wyoming Wildlife Natural Resource Trust
- Wyoming Governors Big Game License Coalition
- East Yellowstone TU chapter
- Water For Wildlife Foundation
- USFS Resource Advisory Council

Project Monitoring: The Wyoming Game and Fish Department (WGFD) will oversee long-term maintenance and monitoring. Fish population monitoring will be conducted annually via electrofishing to assess Yellowstone Cutthroat Trout abundance, distribution, and age structure, with the monitoring schedule eventually shifting to biannual. Visual surveys and targeted sampling will monitor for non-native species upstream of the barrier, and immediate actions will be taken to remove them if detected. WGFD will also inspect the barrier annually to ensure integrity and effectiveness. USFS will assist with inspections and maintenance as needed.

Funding Source(s): National Fish Habitat Action Plan

Project cost: WNTI \$40,000 Total \$914,750

Start Date: 07/01/2025

Completion Date: 12/31/2026

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