

## Reconnecting Canyon Creek

**State(s):** Idaho

**Managing Agency/Organization:** Friends of the Teton River

**Type of Organization:** Non-profit

**Project Status:** Ongoing

**Project type:** WNTI Project

**Project action(s):** Riparian or In-Stream Habitat Restoration, Watershed Connectivity, Monitoring, and Outreach. This project will restore 10.2 miles of stream, and reconnect 45 miles of stream. Additionally, this project will restore on average, 10,680 acre-feet of water annually to Canyon Creek, remove one major entrainment hazard through the closure of the Canyon Creek Canal, and irrigation management changes will be implemented.

**Trout species benefitted:** Yellowstone Cutthroat Trout

**Population:** Canyon Creek/ Teton River/ Upper Snake River

**Project summary:** Friends of the Teton River (FTR), in partnership with the Canyon Creek Canal Company (CCCC), will restore natural instream flows to Canyon Creek, a drainage on the northern flank of the Big Hole Mountains located east of Newdale, Idaho. Canyon Creek supports a core conservation population of native Yellowstone Cutthroat Trout (YCT) and is a high priority for restoration due to its significance as a productive spawning tributary with 45 miles of high-elevation habitat. The lower 10 miles of stream to the confluence with the Teton River Canyon has been seasonally dewatered at the Canyon Creek Canal headgate, which diverts up to 70 cfs of water (via 13.8 miles of a century-old concrete canal) to irrigate 10,615 acres of high-value farm ground. The project will improve irrigation infrastructure and points of diversion to restore up to 10,680 acre-feet of natural stream flow annually to Canyon Creek while providing greater water supply reliability for the irrigation company as well as downstream water users.

FTR and the CCCC irrigators started working together over a decade ago to remove barriers preventing fish migration and restoring degraded habitat. With the participation and support of the CCCC and adjacent landowners, four major fish passage projects, a habitat restoration project, and a PIT tag array were completed/installed between 2010-2015 (with WNTI supporting fish passage and research efforts 2013-2015). In 2019, the CCCC expressed its support to engage in a planning and design process, which was funded through a BOR WaterSMART Phase I grant, to seek solutions that provide for more efficient water delivery, improved water reliability, and improved stream function for the benefit of fish and wildlife. As part of the planning process, FTR and the CCCC piloted a temporary water transaction, closing the Canal to test longer-term solutions and monitor ecosystem response to stream flow restoration. FTR and the CCCC plan to make infrastructure improvements and management changes at two major points of diversion (pump stations) over a two-year project period, increasing their capacity and ability to deliver water from the Teton River. Irrigation conveyance to shareholders on the system will also be improved to deliver water more efficiently. These changes will allow CCCC shareholders to divert their water shares from the main stem river, which is not flow limited, instead of using pumps on Canyon Creek, which is flow limited. Once the project is complete, CCCC will permanently close the canal headgate, which will fully address fish entrainment, habitat connectivity, and water quality impairments (temperature and flow) in Canyon Creek.

This project provides a unique opportunity to collaboratively address water supply and ecosystem needs and completely restore the natural hydrograph in a priority sub-watershed. The proposed irrigation and water management changes will have significant ecological benefits for Canyon Creek and the Teton River Canyon native YCT populations, as well as present an opportunity to improve water management and fully restore ecosystem function on a landscape scale.

**Problem the Project Addresses:** Historically each spring, large numbers of native cutthroat made their way to the headwaters of Canyon Creek to spawn. However, spawning runs were heavily impacted by habitat fragmentation and dewatering. The water taken out at the canal headgate dewateres the lowermost 10 miles of the stream on an annual basis and is a significant entrainment hazard for migrating native Yellowstone Cutthroat Trout (YCT). Despite these limiting factors, Canyon Creek is still one of the remaining strongholds with an intact fluvial spawning run in the entirety of the Teton River Watershed (Schrader 2002; Mabe 2009) and within the Greater Yellowstone Ecosystem. FTR, state and federal agencies, and conservation partners have made Canyon Creek a high-priority stream for watershed restoration, due to its valuable high-elevation habitat on the National Forest, historic productivity, importance as a YCT spawning tributary, lack of hybridization, and the potential to comprehensively address limiting factors for this drainage.

With the participation and support of adjacent landowners and irrigators, four major passage projects were completed between 2010 and 2015. These projects combined have improved habitat and restored passage, and during times of adequate flow have connected 45 miles of valuable spawning, rearing, and holding habitat located between the confluence and the headwaters. FTR installed an interrogation site on Canyon Creek in 2014 to collect data regarding trout movement from the Teton River Canyon. In 2019, the CCCC expressed its support for creating a more efficient water delivery system, which would improve the reliability of water delivery and improve stream function for fish and wildlife. Together, FTR and the CCCC have developed a phased water management plan and irrigation improvements that will mutually benefit water supply and conservation goals. The first phase involved shutting down the Canal for two years, and diverted water from other points of diversion. However, water users didn't receive their full water right shares through the pilot, and current irrigation infrastructure does not support this scenario long term. Throughout the pilot, FTR was able to collect valuable fisheries, water quality, and water use data to quantify the benefits of the project under real conditions, with remarkable results. Beaver have returned to the system, occupying habitat directly below the Canal, and Teton River electro-fishing data show increased densities of YCT near the confluence of Canyon Creek. This demonstrates Canyon Creek's resiliency, and the conservation value of investing in a long-term solution to restore a natural hydrograph. As a range-wide decline in YCT abundance and distribution is possible, this project has the potential to help stabilize and increase populations within the drainage, which would also provide a benefit to local agricultural and recreational economies.

**Objectives:** When completed, this project will have accomplished a number of steps to benefit Yellowstone Cutthroat Trout in Canyon Creek. Infrastructure will be upgraded or replaced, including two major pump stations, main lines, and conveyance lines so irrigation water can be obtained from the Teton River, instead of Canyon Creek. This will also result in discontinuing the use of the Canyon Creek Canal, which currently diverts up to 70 cfs and dewateres 10 miles of Canyon Creek to its confluence with the Teton River, and eliminate fish entrainment issues within the canal. In addition, 10,680 acre-feet of instream flow to Canyon Creek will be restored and connect an additional 45 miles of instream habitat. An additional 4.73 cfs will also be conserved annually, while irrigators will retain the ability to use their full water right.

**Partners:**

- Friends of the Teton River
- Canyon Creek Canal Company
- Idaho Department of Water Resources
- Landowners
- Bureau of Reclamation WaterSmart CWMP Phase 1 Planning Grant
- Western Native Trout Initiative

**Project Monitoring:** Once the project is complete, FTR will continue ecological monitoring of fisheries, water quality, and stream flow with an emphasis on improving the connectivity of the system for native trout life history, while also evaluating improvements to irrigation delivery, efficiency, and reliability. Baseline fisheries data are already established to compare post-project data. Three new irrigation systems will be implemented for water right holders to obtain their allotted shares. The irrigators will be responsible for the maintenance of this system. A remote monitoring device will be installed downstream of the Canyon Creek Canal to gather temperature and stream flow data. Baseline flow and temperature have already been established in order to compare to post-project results. A 25-year water user agreement will also be implemented, which will ensure the closure of the Canyon Creek Canal. Canyon Creek Canal will be closed to eliminate entrainment for spawning and out-migrating YCT. FTR will assess connectivity through visual observation and surveys, as well as electro-fishing surveys for YCT as part of its tributary trout assessment (next occurrence in 2025).

**Funding Source(s):** National Fish Habitat Action Plan

**Project cost:** \$50,000 WNTI funds, Total project cost \$3,221,302

**Start Date:** 04/2023 **Completion Date:** 8/2024

**Project Contacts:** Anna Lindstedt, Friends of the Teton River, [anna@tetonwater.org](mailto:anna@tetonwater.org)